

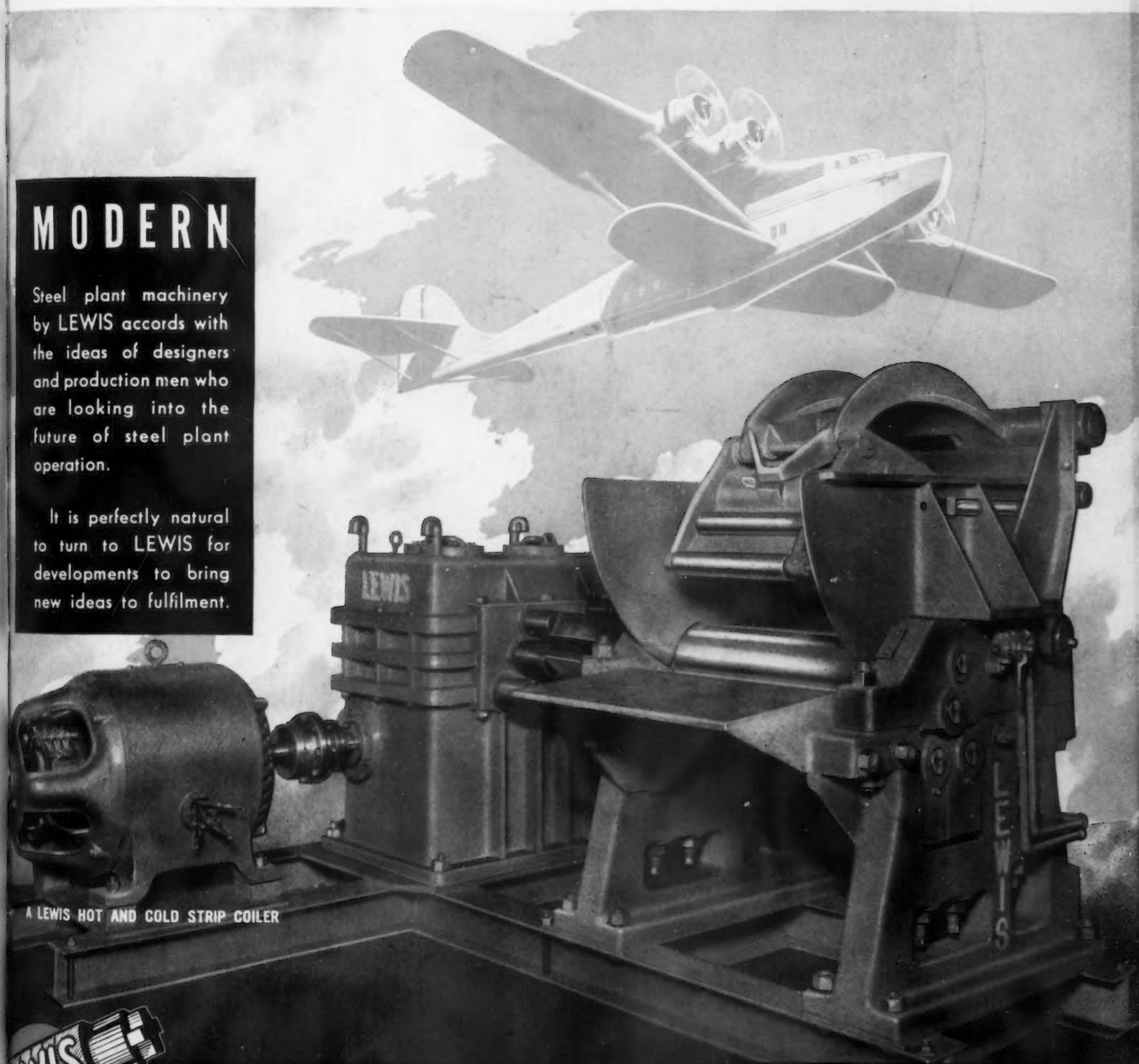
MAY 28, 1936

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Sales Offices
239 WEST 39TH STREET NEW YORK, N. Y.

Owned and Published by



CHILTON COMPANY
(Incorporated)

Executive and Publication Offices,
Chestnut and 56th Sts., Philadelphia, Pa.

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C. S. BAUR, General Advertising Manager

A. H. DIX, Manager Reader Service

Member, Audit Bureau of Circulations

Member, Associated Business Papers

Indexed in the Industrial Arts Index.

Published every Thursday. Subscription

Price: United States and Possessions, Mexico, Cuba, \$6.00; Can-

ada, \$8.50, including duty; Foreign

\$12.00 a year. Single copy, 25 cents.

Cable Address, "Ironage, N. Y."

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THE IRON AGE

MAY 28, 1936

ESTABLISHED 1855

Vol. 136, No. 22

RULERS OF STEEL

It is a popular misconception that colossal enterprises are ruled and dominated by a group of captains of industry or finance.

This idea, as applied to steel, is about 15 years behind the times. It is a holdover from steel's era of construction.

When a house is being built, the masons and carpenters are in charge; after it is made livable and usable, the people who are to use it take command.

So, too, with steel and similar industries. While they are being built, production is the keynote. When they reach maturity, as has steel, the scene changes and the customers take charge.

One hundred million Americans rule and dominate the steel industry. Their demands for goods and services are far more powerful than the votes of stockholders or the arbitrary mandates of management. When they buy motor cars or refrigerators they dictate the policies of our sheet mills; when they ride on railroads or ship by freight they determine the flow of rails and other steels to our common carriers.

The steel industry recognizes clearly this present and future customer rule. If you step behind the scenes in any of our modern steel companies, you will find its policies from product development and new plant construction clear through to delivery based upon scientific and thorough study of present and future customer needs. This is the keynote of modern merchandising in steel as well as in other progressive industries.

In this issue of THE IRON AGE, which marks the 45th general meeting of the American Iron and Steel Institute, we take you behind the scenes and show you something of what is being done in this search to determine and obey the customer's mandate.

John Van Dine



STEEL AND P

▲ ▲ ▲
By E. G. GRACE

*President, American Iron and Steel Institute
President, Bethlehem Steel Corp.*
▼ ▼ ▼

STEEL production has increased in recent months. Many causes have been assigned for the upward trend. Some hold the view that general conditions have brought this about. Basically, however, we may turn to the industry itself to find the reason for much of the improvement.

The volume of production in any large industry is closely related to current general conditions, at any particular time. But over a length of time the conduct of an industry may have a strong influence in determining general conditions. I would like to appraise here some of the things which the steel industry has done, to point out how these things have been basic to our general national economy, and to show how they are conducive to a better economic situation.

Steel has accomplished much during the past quarter century, which has had far-reaching influence and yet has received but little attention. The steel industry has made enormous plant investments and has passed the resulting reduction of costs on to the consuming public. Steel has made extraordinary improvements in its products. These advances have created a constant widening of markets, not alone for the steel mills, but for every consumer and processor of steel materials.

Reductions in Steel Prices

During the twenties the prices of nearly all commodities climbed to new high levels. Steel was an exception. Public commentators frequently seem to forget this, although it was a most significant commercial fact of that dec-

D PROGRESS

ade, not only for that time but for its influence on the future. In the period from 1923 to the present time there has been a reduction in the average price of steel exceeding \$11 per ton.

The extent of this contribution to our general economy may be realized when we note the totals which this \$11 saving means applied to steel products.

Assuming an average rate of production for the year of 60 per cent, these savings in the cost of finished steel to the purchaser would amount to over \$300,000,000 annually.

This substantial saving is in large part the result of the huge investment in steel properties to accomplish lower-cost production. These savings in the cost of steel prove that the funds provided in part by security holders and in part from earnings, have been invested wisely, and for the benefit of the purchaser.

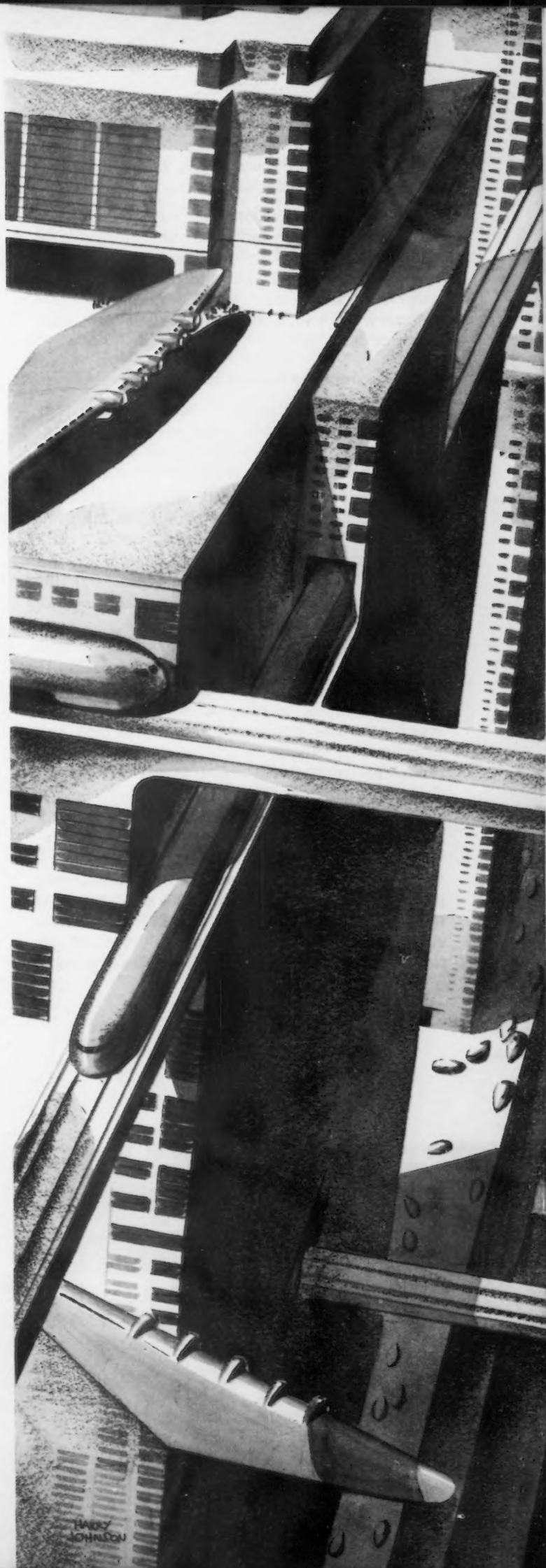
New mills, improved methods, more effective production, all have made steel a better servant of the consuming public.

I am not claiming that under all conditions lower prices as such create more business. Any price situation which destroys profits, destroys industry—and thereby destroys buying power. But under normal conditions when business is operating profitably, the surplus earnings after fair compensation to the capital invested, created by improvements should be reflected in lower costs to the buyers. In such a situation this is a distribution of wealth which is healthful to the entire economic structure.

Low Costs and Mass Production

We have heard much in recent years about low costs and mass production. Steel was the first of the mass production industries, with its early furnaces and rolling mills, turning out thousands of tons of bars, structural shapes, rails, etc., setting the pace. Only through mass production could the steel industry have supplied mass consumption.

Steel's part in serving the mass production industries is self-evident. Many of the industries which have developed quantity output methods use substantial quantities of steel



materials in their products, an outstanding example being the automobile industry. Obviously the mills of the supplier had to be equal to the factory operations of the customers.

Consider the millions of automobiles, the scores of mammoth buildings, the multitude of flat-rolled steel products which have been purchased by the American public, and it becomes clear that there must have been in the steel industry an enormous development for mass production.

Improvements in the Products

Steel's contribution has been more than that of stepping up its production pace. The industry has continuously improved its products to meet new needs.

Our modern economic life could not exist if it depended on the kind of steel available 30 years ago. In those days steel was a crude product, there being but little control of the chemistry, metallurgy, and heat factors in its production as applying to processes in general or to individual heats. Today there are hundreds of classifications in the alloy steel field alone.

The cracking stills of the oil industry are dependent upon grades of steel which will stand up under extreme temperatures and unusually high pressures. The metal stamping industries must have sheet metal with deep drawing qualities. The mining and oil industries require materials of unusual physical properties and at the same time highly abrasion resisting. The railroads must have metal which will withstand terrific continuous impact. The airplane, the ship, the machine tool, the agricultural industries all have their individualistic material requirements. Yet all of these products differing in specifications, proper-

ties and in methods of production are known as steel.

In addition to this material progress, the steel industry has not forgotten the human factor. Men mean more than materials. Throughout the severe depression years the steel industry has kept its working forces intact.

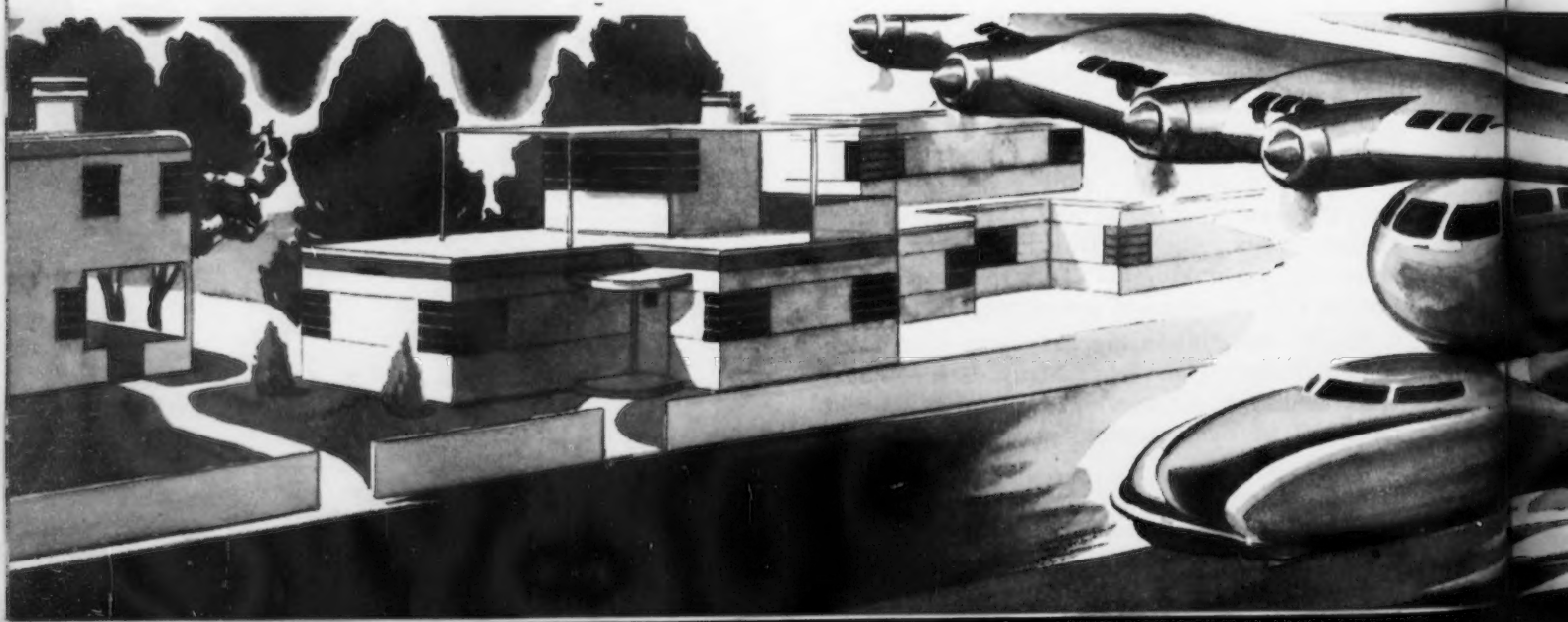
The old-school method was to reduce working forces in step with declining business. In the present emergency that policy was abandoned for the more humane one known as the share-the-work method which kept the working forces intact by distributing the available work equitably among all the employees. In the dire necessity of hard times this policy served to provide a subsistence for the mass of the employees in the industry and maintain their self-respect and morale. It kept the personnel on hand and ready to enjoy a better economic situation as soon as demand was available. From the public standpoint, this policy meant that the steel industry was ready to serve immediately conditions improved.

We need only to look back a few decades to see what a contribution this has been to our present situation. Following the depressions of the past, all of them of shorter duration than this one, there was a mad scramble for men, and oftentimes many months elapsed before normal operations and service to the trade could be reestablished in the industry.

Today, in spite of the wide variation in the different kinds of steel, the mills in the industry have been able to meet every step-up in production demand without a ripple of disturbance.

Widening of Markets

These developments in quantity production, quality products and efficient management rep-



resent important changes in the nature of the steel business, and to these we should also add distribution. Formerly the steel mills supplied direct relatively few customers who bought in large tonnages. Today the mills make a great quantity of different products for thousands of customers.

This diversity in products with its ever-increasing field of distribution will contribute no little to the strength of the steel industry in the future. The job which steel has done in widening its markets is perhaps its largest contribution to the general economic structure. This development of the uses of steel has been largely the result of research. Frequently it has been cooperative research, in the laboratories of the steel customers and in the mills.

Research has become the right arm of distribution. Steel will find more markets because it is developing more serviceable products. The progress which has been made in rust-resisting steels is an example. A generation ago rust was accepted as an unavoidable evil. Today we have not only the high chromium series, but a long line of corrosion-resisting products, the copper bearing steels, and various coatings to resist rust.

There has been great progress in welding. There have been steels made especially for the combination of lightness and high strength. There has been notable progress in rail manufacture by new methods designed to solve the problem of transverse fissures.

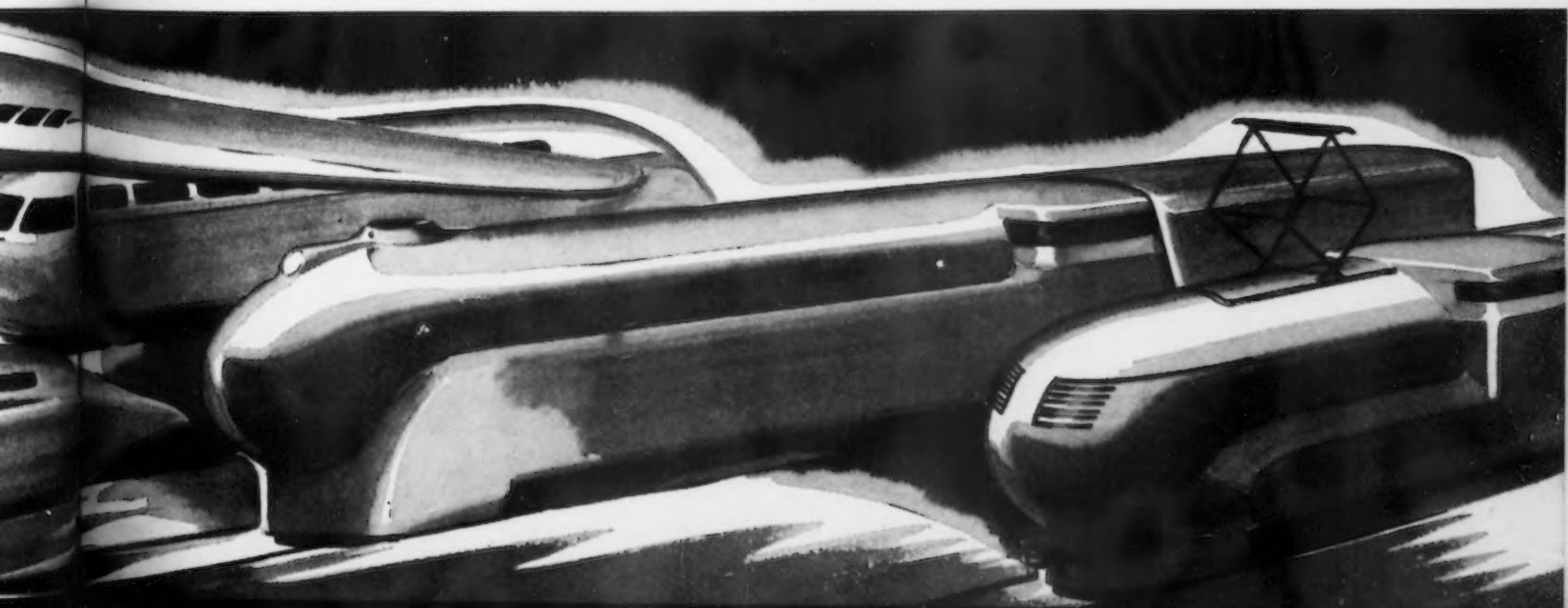
Perhaps the most conspicuous development in the public eye is the continuous sheet and strip mill. These mills involve highly technical, mechanical, electrical and metallurgical problems in their construction and operation. A complete unit represents an expenditure of

\$25,000,000, a large sum even in the steel industry, but justified on the basis of producing a complete line of flat-rolled steel products of better quality, and at cheaper costs, thus assuring a greater demand.

I have mentioned these obvious developments, familiar to most buyers of steel, because they are essentials in the future of our business. The progress of this industry has depended largely upon the finding of new markets. It grew with the railroad business, the automobile, the great post-war building era, and other modern developments. The industry's belief in the growth of these markets and in the opening up of new ones, is evidenced in its current plant investment program.

It is significant of the steel industry's confidence in the long range future that many of the present-day research and construction programs were originated in the darkest days of hard times. Steel accepts for the future as in the past its responsibilities in contributing to our national advancement.

I have referred to the leadership of steel in mass production, quality products and efficient management. I have pointed out that these policies have resulted in great savings to the consuming public, and I have indicated the part which research is playing in the present situation. What has been done in the past is an index of the future. It would be possible to list scores of possibilities for larger steel markets. For example, much could be said about the future of steel materials for residence construction. But each of these instances is included in the general consideration that the steel industry sees that the route of its progress lies in its increasing serviceability to the consuming public. In our future economic life, as in the past, steel will do a creative job.



E. G. GRACE

President, American Iron and Steel Institute
President, Bethlehem Steel Corp.

THE career of E. G. Grace, from laborer in a steel mill to chief executive of one of America's greatest industrial organizations, is a notable example of the opportunity that the American system of enterprise offers to hard work and ability.

Spectators at Lehigh Varsity baseball games in 1898 and 1899 who saw the energetic team captain come to bat could scarcely be expected to foresee the home runs that "Gene" Grace would later score on the field of industry. The same keen enjoyment of the game and the spirit of sportsmanship in competition that characterized his undergraduate activities have been evident throughout the successively advancing stages of his later career.

Following is a brief chronological summary of his activities:

- 1899—Graduated from Lehigh University as an electrical engineer and entered the employment of Bethlehem Steel Co. as crane operator.
 - 1902—Appointed superintendent of yards and transportation and systematized the handling of materials in the yards of the company.
 - 1905—Sent to Cuba to reorganize the Juragua Iron Co., a Bethlehem subsidiary.
 - 1906—Appointed general superintendent of Bethlehem in charge of construction of new Saucon plant for wide flanged sections.
 - 1908—Appointed general manager of Bethlehem Steel Co.
 - 1913—Elected president of Bethlehem Steel Co.
 - 1916—Elected president of Bethlehem Steel Corp.
 - 1917—Organized production of munitions for America at request of United States Government.
 - 1918-19—Reconverted the corporation's activities to the production of peace-time products.
 - 1933—took a leading part in helping to organize the steel industry for operation under NRA code.
 - 1934—Received the Gary medal for distinguished service to the industry.
 - 1934—Elected president of the American Iron and Steel Institute.
-



E. G. GRACE, President, Bethlehem Steel Corp., Bethlehem, Pa. Drawn by John Frew for The Iron Age.





Market Studies Uncover New Steel Uses and More Steel Profits



WHAT can market research do for the steel business? Can it increase steel's sales or steel's profits? Can it untangle some of the vexing problems that have been complicating the marketing of steel in recent years? Can it remove some of the difficulties that competition and the flux of economic and social change have been piling up in the channels through which steel is sold? Or is market research just a bolt

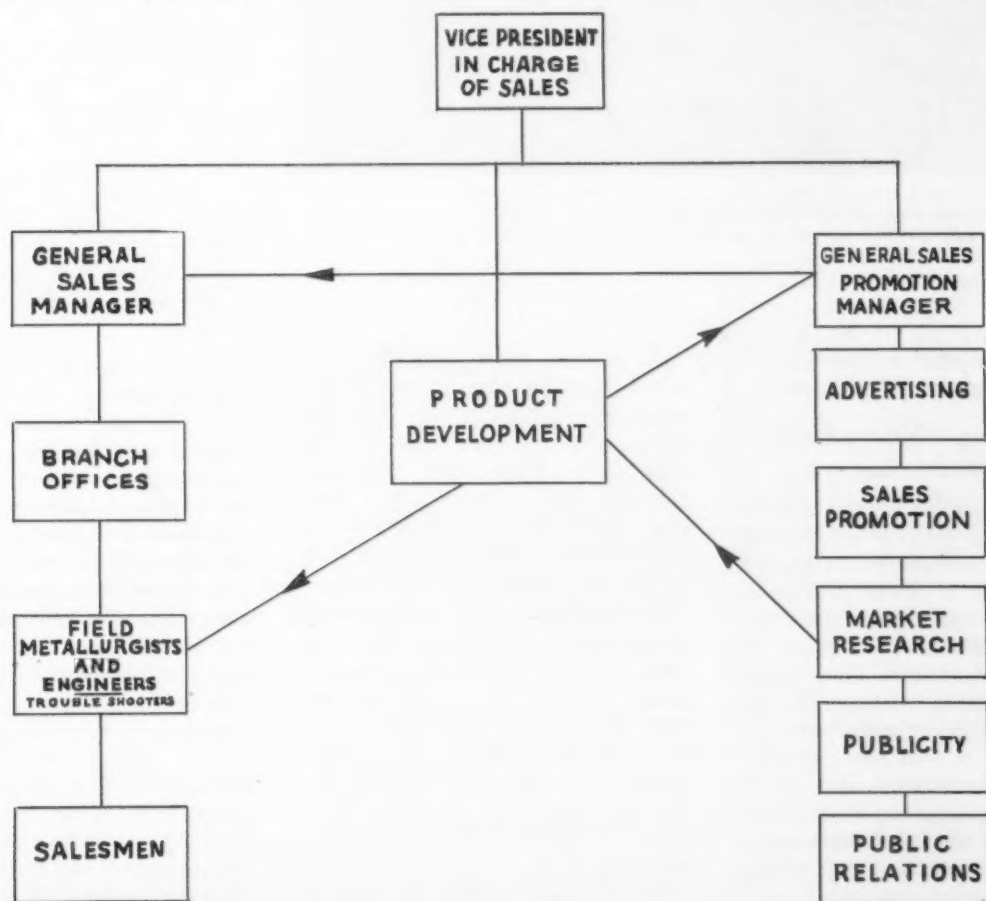
By JOHN ALLEN MURPHY

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of rucking that has been attached to old-fashioned selling to style it in the 1936 mode?

The answer to the last question is decidedly NO, and to the others an emphatic YES. "Market re-

search" is a much misunderstood term. Unfortunately, it has a professorial twang to it that gives many the impression that it must be of Brains Truster coinage. Actually, however, the term implies nothing more than making a studious approach to a market or to the solution of any marketing problem, instead of using the customary rule-of-thumb approach. It is the slide - rule - microscope - test - tube-principle applied to the selling side of business, just as such scientific





STEEL is the framework on which modern life is based. Market research is not needed to sell a modern apartment building.

methods have long been used in the production division of business.

Determining What the Buyer Wants to Buy

In most cases market research is undertaken to get the attitude of a market toward an idea, a plan, a proposition or a product. This is done on the assumption that the market knows what it wants, or at least has fairly definite ideas about what the seller is offering. In the long run, the seller must give the market what it will buy. Experience has demonstrated that in all lines more money has been made in selling, not what the seller wants to sell, but what the buyer wants to buy.

Of course, it is true that the seller may be able to create demand where none exists. This demand, however, can only be created under terms and conditions that the buyer favors. As a general thing, unpalatable goods or propositions cannot be profitably forced on a prospective market.

The rule-of-thumb seller jumps into a market with a new idea or a new product, and after making large expenditures trying to put over his proposition, learns what he could have found out in advance—that the market will accept his idea, under certain conditions, or that it will not accept it, and why.

Sales research offers the seller a

short cut to his markets. If his merchandise or his proposition is not right, he will find that out before he has spent any money in unproductive selling. If his goods or his plan can be sold, market research will determine that for him, and tell him just how he can proceed into the market in accordance with the buyers' wishes. Thus costly experimental selling is avoided.

Steel Not Backward in Sales Research

The steel industry has often been criticized for being backward in doing market research. The critics charge that it has sat back and let its markets come to it. Actually, however, the steel business has been no more backward in this respect than most other material-producing industries. In fact, it has been more progressive than many of them. Those who have been lambasting the steel industry for its inactivity in developing new markets are not well informed on the functions of the sales division of business. The job of the sales department of any organization is to sell, to get whatever business is available right now, to see that enough orders come in to keep the plants producing at capacity. The sales department of a company properly concerns itself only with immediate business, with catering to demand that exists today, with getting its share of the business that is being placed. Strictly, it is not its function to bother with markets that are undeveloped or with fields that require much cultivation before they can be expected to produce a profitable volume of sales.

The development of new markets or new uses is a function of the sales promotion department. Sales promotion has been defined as anything and everything that can be done to **promote** sales. Market research is one of the numerous activities in which sales promotion departments engage. And it is one of the most important of them, because it is the liaison operation that maintains the line of communication between the field and executive headquarters. It is the activity which lets the management know what the markets are demanding. Sales research is a scouting or missionary influence that precedes the entrance of the salesman into a field, and that fur-

nishes the sales department with the knowledge to enable it to pave the way for the salesmen, and to run an educational campaign in that market that will break down much of the resistance they will have to meet.

In a properly organized company, the sales department and the sales promotion department work separately, performing radically different functions, although both are striving toward the attainment of a common aim—to get more business for the company. As a rule, under this setup, both departments are coordinated under a vice-president in charge of marketing. In a way these departments are comparable to a hunter and his dog. The research worker flushes up the prospect and the salesman bags him. The only difference is that in selling under this method, the bird-dogging is done long in advance of the shooting. In other words, the sales department's job is to get business today, whereas the sales promotion department's job is to see that the company has business tomorrow.

Nation's Great Appetite for Steel

The steel industry did not engage extensively in systematic market research until recent years. It didn't have to. One of the most amazing things about the commercial development of this country was its insatiable appetite for steel. One tonnage market after another sprang up overnight, and for years continued to devour steel as fast as it could be made—railroads, machinery, skyscrapers, ships, automobiles, bridges, pipe lines, etc. In fact, with its theoretical 70 million ton annual capacity, the steel industry must have huge tonnage markets. Keeping this mighty capacity going is the herculean task that fell to the lot of the sales departments of the steel companies. The heights of prosperity that the industry has attained proves that as a whole these sales departments must have done a pretty effective job. Certainly a lot of steel was sold and somebody must have sold it.

While it was only during the last 10 years that the industry became research-conscious, developments began to take place more than 30 years ago that made it inevitable that sooner or later steel producers would have to make a more scientific study of their markets. About 1905 steel users began



BACK counter flashing, wall panels and grills of up-to-date bars are ideally suited for the use of stainless steel.

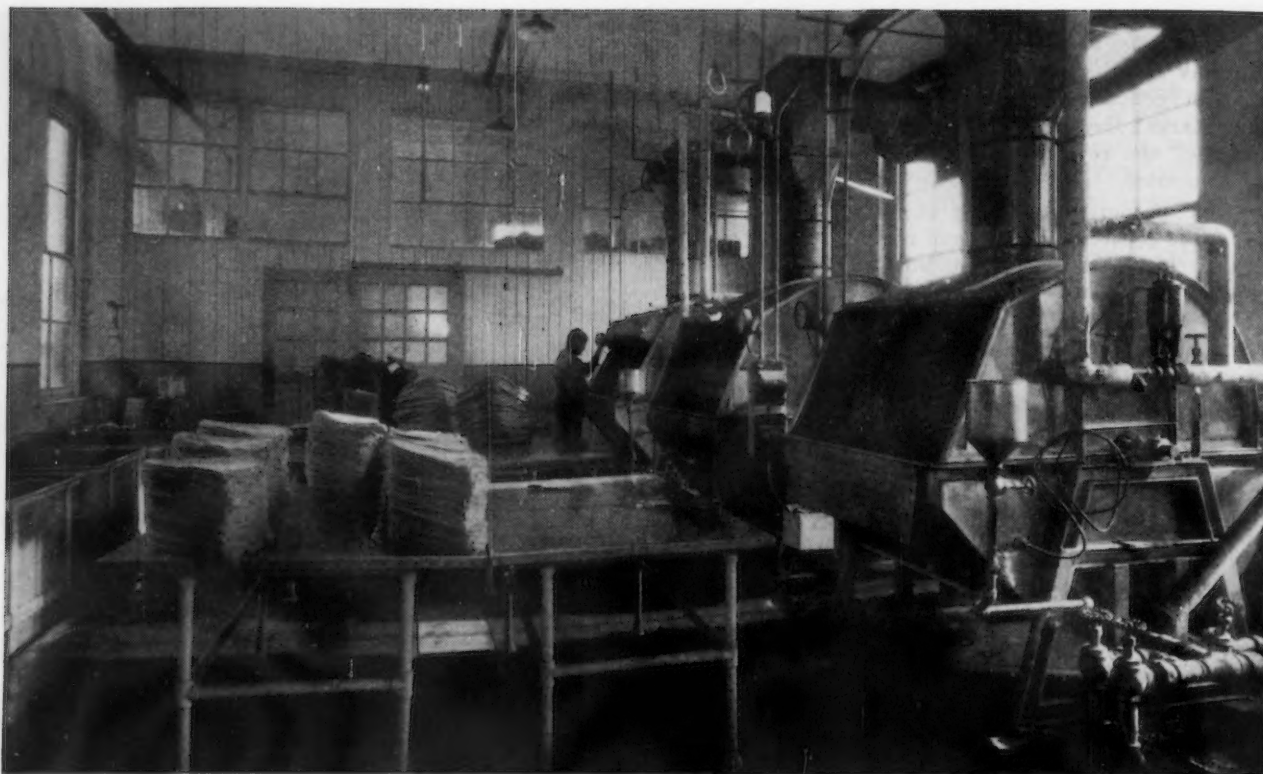
to get more exacting. They began asking for special steels, for steels made according to their own prescriptions. It was about this time that the machine age reached full flower. Machinery, production, transportation, life itself, started to run at higher speeds. And, of course, this brought a demand for qualities in steel that previously had not been needed—capacity to stand up under higher temperatures, high tensile strength, toughness, ability to resist abrasion and corrosion, more elasticity, easier machineability, etc.

Users Became More Exacting

The anti-friction bearings manufacturers should probably be

given credit for starting the special steel movement. They simply had to have harder steel than was available at that time. Looking back at what they did, one cannot help but admire their nerve. They brought their hypothetical prescription for what by comparison must have seemed like a few pounds of steel, to an industry that was accustomed to measuring units of shipments in thousands of tons. The point is, however, that they did get a steel mill to experiment with them, and to produce what they wanted!

On the heels of the anti-friction bearing folks followed the automobile manufacturers with their insistence on all sorts of special steels, both for fabrication in their



STAINLESS steel enters into the manufacture of hats. In this case it is used for cylinders.

cars, and to be used as production equipment. In a short while, the special steel tide was rising and has been mounting ever since. Gradually, the steel producers gave recognition to the movement, but they did not exploit the growing demand for special steels as systematically as they might have done, for reasons already explained—they were too busy filling orders for huge tonnage buyers. Even some of the specials, as in the case of automobile steel, shortly climbed up into the large tonnage group. That often happens. If the product that is tailor-made at first fills a real need, it will step into staple production.

Depression Brought Market Research

It was the depression that changed this let-well-enough-alone situation. As a way out of their difficulties, the steel people started to analyze their markets more scientifically, and to show less faith in the old rule-of-thumb methods. They turned to research, because it is the only reliable means of solving problems.

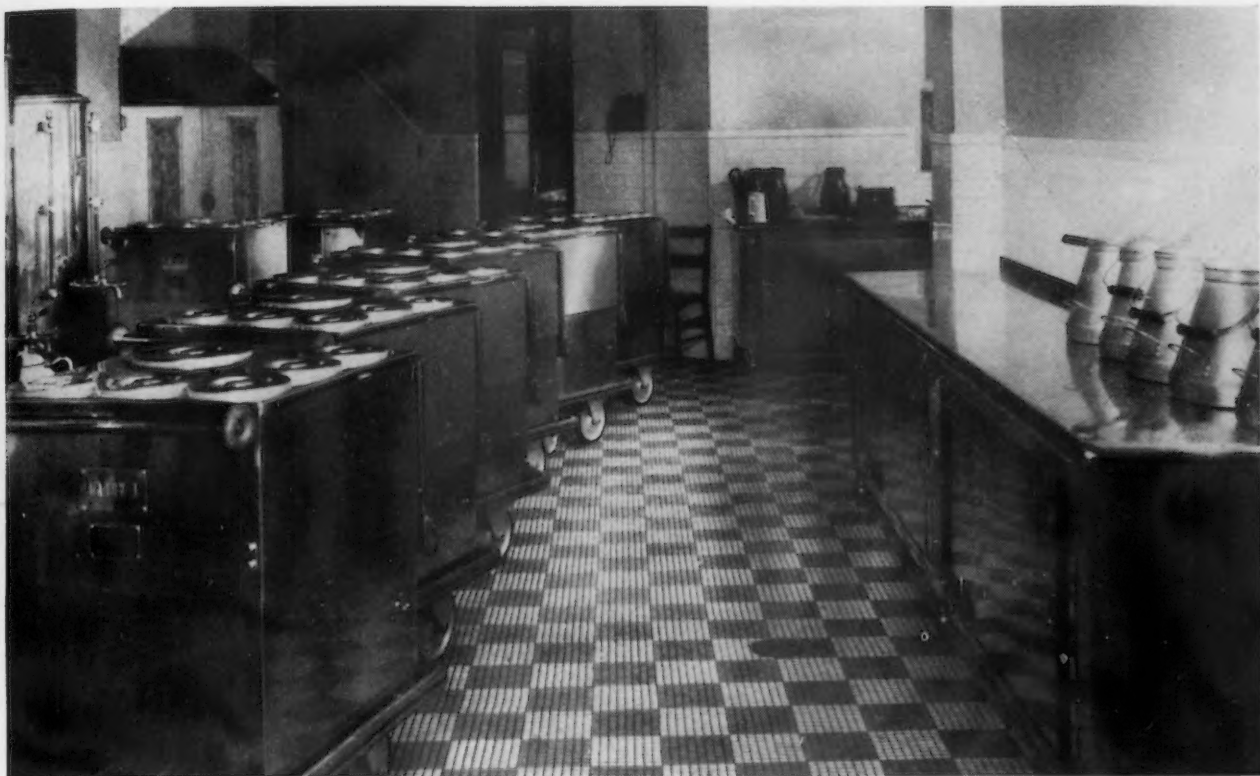
What sort of market research has been done in the steel busi-

ness? It is impossible to generalize on the subject of market analysis. There are as many kinds of market studies as there are markets or marketing problems or products to market. I have personally made scores of market studies, many of them in the steel business, and scarcely any two of them have been alike.

Types of Market Research

These studies, however, can be grouped into types. The principal types of work of this character being done in the steel industry are:

- (1) Studies to find how new steel products can be marketed.
- (2) Studies to find how new markets for steel can be opened.
- (3) Studies to find why old markets are slipping.
- (4) Studies to find what makers of rival materials are accomplishing in certain markets and to ascertain why they are successful.
- (5) Studies to locate the source of resistance being encountered in some fields, determine its exact nature and find how to overcome it.
- (6) Studies to isolate hidden factors behind the scenes that are holding up business, but that do not show their hands openly.
- (7) Studies to learn who are the persons that have decisive buying influence in a buying organization, but whom the salesmen cannot locate or get to.
- (8) Studies to ascertain new buying trends in large markets.
- (9) Studies to ascertain trends in the distribution of steel products.
- (10) Studies to get data on unusual installations of steel products.
- (11) Studies in retail stores to find what new products made of steel are being merchandized.
- (12) Studies to find the trend in the use of equipment in institutions—hospitals, hotels, restaurants, schools, etc.
- (13) Studies of fabricators' business, to discover what new steel products they are making.
- (14) Studies in the architectural field to learn of trends in building design.
- (15) Studies among product designers to get the drift of the



INTRODUCING steel into kitchens has not been an easy job. Market research has played an important part.

current in this professional field of growing importance.

- (16) Studies to find trends in steel use or in product design in any specific industrial market.
- (17) Studies of the laboratory research activities that may be going on in steel markets.
- (18) Studies to find how parallel or similar industries are solving problems that the steel industry is trying to solve.

Research Should Attack Specific Problem

It would be interesting to relate something of the findings of investigations that have been made under each of these 18 types of studies. However, I must confine myself to an account of how a typical survey is conducted, and of what practical use is made of the facts that are found.

The organization that is inexperienced in making market studies is likely to try to take in too much territory, or aim at too wide an objective. In that case, the results are usually unsatisfactory. The cost of doing the work will be excessively high, and the data produced are likely to be confusing, or at best, inconclusive. A better plan

is to give the research job a sharp angle, to define its purpose closely, to direct toward the solution of a specific problem. Instead of studying all of the markets for steel, restrict the job to just one market or to only one product.

Another mistake that is frequently made is to regard market research as only a statistical appraisal of a market. While mathematics plays an important part in research, it is easy to get so involved that the study will produce nothing, but a lot of meaningless tabulations. I have found that in analyzing industrial markets, it is not safe to regard statistics as anything more than supporting evidence. It is seldom possible to get enough figures in any study to base conclusions on them. It is a much sounder plan to look for principles. After studying any problem or particular market for a few months, certain principles reveal themselves so clearly, that there can be no mistake about them. Also, principles are more fundamental and less subject to the influence of the variables in every situation than are statistics.

The basis of a market study is the field survey. The survey con-

sists of personal interviews, with various factors in the market being investigated. Questionnaires should be used only as an additional check-up. As to the number of interviews it is necessary to get, that depends on the scope of the job. In a sharp-angle study, though, such as an investigation of the trend in equipping hospital kitchens, the interviews will generally stabilize, when about 200 of them have been obtained. That is, not enough new information will be received in each new interview after that to justify going further.

The interviewing should be done by specially-trained interviewers. These men are the opposite of salesmen in their make-up. Salesmen are aggressive, convincing talkers, always ready to present their propositions, constantly on the alert for an opportunity to sell. That is why salesmen make the worst possible research men. It explains why companies that leave their sales analysis work, sales promotion and market development to their sales department seldom get anywhere.

The best interviewer I know is a soft-spoken, courteous, educated gentleman. While he is well in-



TIN cans are the outstanding use of steel in the food industry, but there are many other applications. This is a modern fruit store

formed on all the business that he investigates, he does not air his knowledge before those he is interviewing. He keeps his opinions to himself. He talks as little as possible, confining his remarks to skillfully framed questions. He uses the journalistic method of interviewing, getting long, interesting stories in most interviews. He does not take notes, as to do so would slow up the man to whom he is talking. He is always informal, giving the impression that he is merely chatting with a friend about an absorbing question. He never lets the man approached know that he is being "interviewed," as that might scare him to silence.

Interpretation of Findings

But the best interviews in the world won't do much good, unless they are interpreted, and unless something is done with the information they contain. The competent market analyst must be able to find the significance in the field interviews and be qualified to make recommendations for a plan of action to deal with the situation the survey revealed.

Let us suppose that a particular study was made to find out if a certain alloy could be sold in a market that had been using other materials. The field interview would have developed what other

materials are being used and why. It would have found the weaknesses, if any, in these other materials. It would have discovered the prices paid for them, just how they are sold and in what quantities. It would have ascertained if the alloy steel could compete in this field and under what conditions. How can it be sold? Etc.

As a result of this study, it was possible for the mill's sales promotion department to hand the sales department a ready-made plan for reaching this new market. The promotion department launched advertising and prepared educational literature, to make it easy for the sales department to break into this new field. The copy idea for this sales literature was produced as a by-product of the survey. That, by the way, is something a market study nearly always does. It brings in a wealth of data, stories and such matter that can be used in advertising, in sales literature and in sales presentations.

In another study into a new market, it was established that the industry being investigated was not satisfied with the material it was using, because it was not acid resistant. When this fact came out, the steel mill's metallurgists were set to work to see if they could develop a special steel that would stand up under the chemicals used

in the aforesaid industry. The metallurgists succeeded. Then the sales promotion staff got busy again, and originated a sales presentation for the salesmen to use in selling this new market. In fact, the salesmen were put through a special training course to teach them how to sell this field. What a far cry this was from the rule-of-thumb selling methods that used to prevail in the steel business!

Laboratories Enter Picture

This incident also brings out the need for cooperation between market research and laboratory research. The market investigators find what is wanted in the nature of the product. It is the laboratory's job to produce these qualities. The greatest progress is being made by those companies, where there is close team work among the sales promotion department, the research laboratory and sales department. The promotion department scouts new markets and learns what can be sold to them, the laboratory creates the goods, and then the sales department sells them.

The steel industry has often been criticized for letting its customers originate new uses for steel. It does not deserve such criticism. The steel industry is not supposed to do the research for its customers. All it should do is to keep

FOR this store front steel has been used for window trim, base trim and entrance doors.



informed on the developments taking place in its numerous markets and to keep its methods, both in production and in selling, in step with these developments.

Where the marketing division of a steel producer is well organized, its sales department sometimes asks the promotion department to find out the cause of the resistance being met in certain markets. In one such case, it was found the presidents of a number of large buying companies had agreed not to buy the special steel being offered to them by the mills. The buyers did not know of this agreement. All they knew was that their orders for this special steel were being killed higher up. The mill's salesmen could not reach these higher-ups. The market investigator did reach them, and found the reason for their resistance. They thought the price of the special steel was too high. That being known, it was a comparatively simple matter to prepare a sales agreement to break down this objection.

In another case, a steel company seemed to be losing the order for the structural steel for a skyscraper, although it felt it was entitled to the business. The worst of it was that the salesman could not find why he was making no headway. The market analyst

found the reason. A big stockholder in the company putting up the building had to be sold. He was the final influence. He could not be reached by salesmen, telephone or mail. But he read one publication religiously. Believe it or not, a teaser campaign in that publication did reach him and was the means of landing the order.

Analyzing Sales Department

The sales development department is frequently asked to find out why certain salesmen are doing so much better than others or why certain methods of selling are so much more productive. As a result of these studies the average efficiency of a sales organization may be increased considerably.

And at least in one case the entire selling organization of a large steel company was put under the microscope of the sales analyst. The investigators found that the company was using an outmoded branch-office set up. Each subsidiary and each special department was operating out of its own offices. The best practice among large companies in other fields is for all subsidiaries and divisions to operate out of the same offices, and that regardless of how many types of salesmen, metallurgists and other specialists there may be calling on a large buying organi-

zation, that there should be one contact man on that account responsible for all other persons that may be calling on it. It is this super-contact man's job to see that his customer is not bothered by too many calls by his company's salesmen.

And thus, we might go on almost endlessly detailing the important place that market research has come to play in the steel business.

Bethlehem Starts New Tin Plate Mills

BETHLEHEM STEEL CO. has placed in operation its new continuous cold-strip mill for the manufacture of tin and black plate at its Sparrows Point, Md., plant.

The product of this new mill will be known as Bethcolite. It meets the rapidly developing need of consuming industries for cold-rolled tin and black plate possessing excellent deep-drawing qualities, close gage tolerance and exceptionally smooth surface.

The mill, which supplements Bethlehem's existing facilities for the manufacture of tin and black plate, has an annual capacity of 96,000 tons.

IN these days of alloy steel, more exacting requirements for many grades of steel, and more precise control of steel quality, scrap has become a vital topic in the steel industry. In reviewing the technical and economic importance of iron and steel scrap, Mr. Williams covered the supply of old material and the growing importance of its exportation. He then discussed the ratios of scrap and pig iron in open-hearth practice and the effect of high scrap charges on steel quality. After showing that steel of high quality can be made by various types of operation regardless of the amounts of scrap used, the author considered the residual-metal contents of the steel resulting from the kind of metallic charge. This part of his paper is reprinted in full.

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M E A S U R A B L E amounts of the metals copper, nickel, chromium, tin, arsenic and antimony are to be found in practically all commercial open-hearth steels now being made. Lead, zinc, molybdenum and vanadium have been detected in extremely small quantities in all the steels we have examined. These metals have got into the steel adventitiously, through the raw materials used in making the steel, and usually are determined on samples taken from the furnace prior to the addition of the alloying agents. Thus, they are residual metals. Residual manganese and silicon are not included in this study for obvious reasons and aluminum is not considered.

Although an exhaustive study has not been made, the literature describing the early iron and steel practice in this country and examination of a few old samples of puddled iron, Bessemer and open-hearth steel indicate that important amounts of several of these residual metals, especially copper and arsenic, were present. These originally came from the raw materials used and once having got into steel became widely disseminated as the scrap went back into new steel.

Sources of Residual Metals

Copper was present in important quantities in the early pud-

*Abstract of a paper to be delivered before the American Iron and Steel Institute, May 28.

dled iron and steel made in this country. Its original source was the eastern iron ores. The Lake Superior ores are quite low in copper but many other ores and pyrite cinder have continued to supply copper to steel. Since the wide use of the Lake Superior ores, the increasing amounts of copper coming from non-ferrous products such as bushings, copper wire and tubing, etc., and from copper-alloy steels and cast iron have served to maintain or even raise the residual-metal contents of most steel.

Most of the residual nickel, doubtless, has come from deliberate additions of the metal to steel and cast iron to improve their

properties. Chromium too has come largely from alloy-steel scrap, also from furnace linings when plain carbon steels are made in the furnace subsequent to a chromium-steel heat, although some iron ores contain important amounts, and now that open-hearth slag is being charged in the blast furnace, some chromium is coming from this source. Mill scale from the rolling of nickel and chromium steels may be an added source of these metals.

Tin has been found in very small amounts in a great variety of steels. Undoubtedly, most of it has come from the large amounts of detinned scrap used in the open-hearth charge, to poorly detinned



Technical Importance of Iron



of Iron and Steel Scrap*

By CLYDE E. WILLIAMS

Director, Battelle Memorial Institute,
Columbus, Ohio

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or often untreated tinplate scrap or old tin cans or other utensils charged in the open hearth or in the cupola or blast furnace. Some tin also comes from babbitt, bronze and other tin alloys used in ferrous structures and from galvanized scrap.

Arsenic has got into steel through iron ores, pyrite cinder and some coke. It is found in

small quantities in many iron ores, being especially high in some of the Southern United States ores and in certain foreign ores that have been imported into this country. Much of the antimony must have come from ores also, although, unlike arsenic, it is now a common constituent of some non-ferrous alloys, especially bearing metals and bronze bushings. Last year a considerable amount of antimony got into the steel of two rolling mills through the inadvertent inclusion in a shipment of steel scrap of some ingots of cast scrap, presumably reclaimed from some non-ferrous material, containing from 24 to 32.5 per cent antimony.

Lead comes largely from lead coated or painted steel scrap or from lead or lead-alloy (bearings and bushings) parts inadvertently charged with steel scrap. Zinc-coated steel, brass and zinc-base die castings are the principal sources of zinc. Molybdenum and vanadium alloy-steel scrap chiefly account for these metals, although some ores contain important amounts of vanadium.

Recovery of Residual Metals in Steel

Practically all of the copper and nickel in the charge of the blast furnace, cupola, Bessemer, electric or open hearth, is recovered in the cast metal. A high recovery of chromium is made in the blast furnace, owing to the strongly reducing conditions. The recovery of chromium in the steel in the open hearth varies with the oxidizing condition of the bath, length of time of the refining period, carbon content of the steel and the slag composition. One operator has reported that when running on a high-scrap charge, the chromium content of the bath was 0.054 per cent after the lime was up and 0.023 per cent in the finished steel; the finishing slag contained 0.84 per cent Cr_2O_3 . This small content of chromium did not adversely affect the slag. No definite information is available to the writer on the recovery of tin, arsenic and antimony in open-hearth steel. It is probable, though, that nearly all the tin and a fairly high proportion of the arsenic and antimony remain in the steel. Zinc volatilizes at steel-making temperatures. Part of the lead in the charge vaporizes and part settles through the bath and into the furnace bottom. Only a trace of lead and zinc usually remain in the finished steel. Nearly all of the molybdenum is recovered in the steel but as yet it is present in negligible amounts. Some of the vanadium remains in the steel, although much of it may be present in the form of the oxide.

The residual-metal content of steel varies greatly with the character of the metallic charge. Since these metals have become widely disseminated in steel, through the use of scrap, it is difficult to make steel free or nearly free from these elements except by avoiding the use of outside scrap entirely. In this respect, plants using high pig iron charges are at an advantage, provided, of course, that the pig

iron does not contain large amounts of the residual metals. One plant producing duplex steel reports that the maximum residual metal content of a large number of heats was Cu 0.02 per cent, Sn 0.006 per cent, and no nickel or chromium. Another plant using hot metal and only plant scrap reported maximum analyses of Cu 0.04 per cent, nickel 0.015 per cent, chromium 0.022 per cent, while another analysis showed Cu 0.01 per cent, and no nickel, chromium or tin.

An investigation made at Battelle Memorial Institute in cooperation with the open-hearth committee of the A.I.M.E. showed that at one plant the average residual-metal content for steel made in 1935 from about 50 per cent pig iron and 50 per cent scrap, of which less than one-half was outside scrap, was copper 0.045 per cent, nickel 0.015 per cent, chromium 0.006 per cent, tin 0.005 per cent. This low content was obtained by exercising great care in avoiding plant alloy-steel scrap, by purchasing outside scrap of the lowest possible alloy content, avoiding automobile scrap entirely and by sorting non-ferrous alloys from the scrap before using.

Contrasted with this is another operation using about the same ratio of pig iron and scrap, but in which less attention is given to the avoidance of residual metals. The average residual metal composition of this steel for the year 1935 was copper 0.087 per cent, nickel 0.043 per cent, chromium 0.022 per cent, tin 0.011 per cent. Steel made from scrap charges running up to 75 per cent of the charge had an average residual-metal composition in 1935 of copper 0.279 per cent, nickel 0.053 per cent, chromium 0.052 per cent, tin 0.038 per cent.

In all these examples the arsenic and antimony contents were about 0.01 per cent each. Some steels made from high-arsenic pig

iron that the writer has examined have contained as high as 0.034 per cent arsenic. In a fairly recent investigation, Bauer in Germany reports that the arsenic contents of several hundred samples of American, English and German steel boilerplates ranged between 0.013 and 0.095 per cent, most of them being between 0.035 and 0.045 per cent. He reported that American plates ran from 0.013 to 0.021 per cent.

Lead, zinc, molybdenum and vanadium were detected in all these steels, but their contents were very small, i.e., less than 0.001 per cent.

In the tests cited above, of the steel made during 1935 in 18 plants, the lowest total residual-metal content was 0.09 per cent and the highest 0.45 per cent. These figures represent average samples of the year's production of steel. At all the plants individual heats are made that run much lower than the average determinations. In fact, the plants that normally make steel of a rather high residual-metal content, make many heats exceptionally low in residual metals by choosing low-alloy scrap. When 60 per cent or more scrap is used and special care is not given to the selection of low-alloy scrap and the removal of non-ferrous alloys, heats are made that contain considerably higher contents of residual metals. Copper frequently goes above 0.20 per cent and sometimes to 0.50 per cent. Tin often runs 0.03 to 0.05 per cent and at times to 0.10 per cent. Nickel contents of 0.03 to 0.10 per cent are not unusual. Crook and Taylor reported a steel, not intentionally alloyed, that contained 0.20 per cent nickel and 0.30 per cent copper.

The work of determining residual metals in steel, referred to above, has been going on since 1929. Analyses for the first two years were made by the United

States Bureau of Mines, Pittsburgh Station, under the direction of C. H. Herty, Jr. Since then they have been made at Battelle Memorial Institute. The cooperating steel companies have taken samples from the open-hearth of representative heats prior to making alloy additions. These samples have been made up into monthly composites and submitted for analysis. At first quarterly, and later annually, composites were prepared from these, and analyses made.

To show how the residual-metal contents have changed with time, the average results based on capacities have been plotted for the 10 plants that have submitted samples throughout the entire seven years. This is shown in the accompanying chart. The values plotted are for the preceding quarter up to 1932 and annually thereafter.

It is evident that the content of residual metals in steel is not increasing rapidly in spite of the large increase in recent years in the proportion of scrap used in the open-hearth charge. The character of the scrap used has a greater influence on the residual-metal content than the amount. A survey of several steel companies made in 1932 showed a definite increase in copper, nickel, tin and chromium in steels made in plants that increased the proportion of automobile scrap in the charge during the period under investigation.

The variations from year to year may have been due to changes in the character and amounts of scrap used in individual plants. The fact that results are not much different for 1935, when 57 per cent scrap was used in the charge, than for 1930, when only 50 per cent scrap was used, may indicate that more care is being exercised in the elimination of non-ferrous alloys from the scrap.

Inasmuch as lower residual metals can be secured by increasing the proportion of pig iron in the charge, the analyses of pig iron made at four different plants is shown in the accompanying table.

The high chromium contents came largely from the open-hearth slag used in the blast-furnace mixture. The iron and steel scrap and mill scale used in the charges account for the bulk of the other metals present.

One operator has reported an in-

Analysis of Pig Iron in Four Different Plants

	1 (Scrap*)	2	3 (No Scrap)	3 (Scrap)	4 (No Scrap)
Copper	0.008	0.002	0.007	0.042	0.010
Nickel	0.016	0.003	Not Det.	0.017	Not Det.
Chromium	0.051	0.015	0.005	0.052	0.048
Tin	0.007	Not Det.	None	0.006	None
Arsenic	0.009	Not Det.	0.004	0.010	0.009
Antimony	Not Det.	Not Det.	None	None	None
Lead	Not Det.	Not Det.	None	None	None
Vanadium	0.011	Not Det.	Not Det.	Not Det.	Not Det.
Molybdenum	0.001	Not Det.	Not Det.	Not Det.	Not Det.

* Steel turnings and iron borings from machine shop.

vestigation to determine the nickel and copper contents of No. 2 scrap. Test heats were made using charges consisting of No. 2 scrap and hot

stances to guide the operator in setting up standards for certain uses.

Tin and antimony exercise a bad

addition of nickel apparently does not correct this difficulty as it does with copper-bearing steels, and that the effect is intensified if copper is present at rolling temperatures above 2000 deg. F. and lessened at lower temperatures.

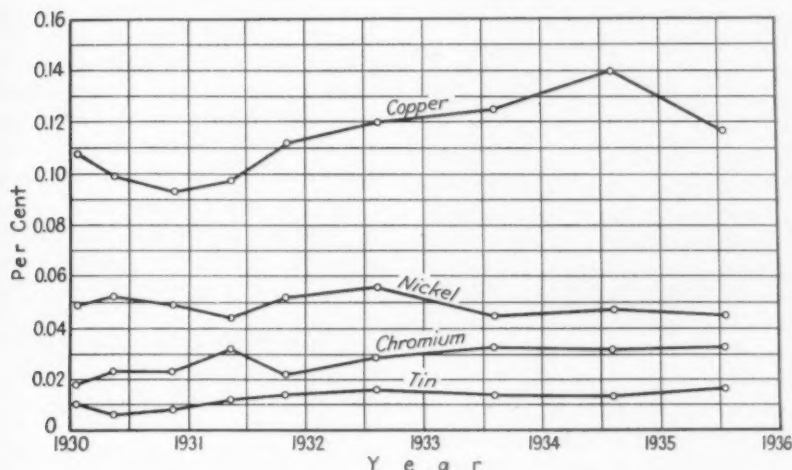
Copper does not form a carbide but goes into the ferrite and strengthens steel. Likewise, copper aids the atmospheric corrosion resistance of steel. Its roughening effect on the surface is perceptible at around 0.35 per cent, and is especially noticeable when the steel is scaled badly before rolling either by high heating temperatures or long heating periods. The presence of nickel in amounts up to one-third or one-half of the copper content suppresses or even prevents this phenomenon.

Arsenic, in the amounts experienced, up to 0.09 per cent, apparently does not have this effect common to copper, tin and antimony. Its effects on steel may be expected to be like those of phosphorus.

Nickel, like copper, strengthens the ferrite and should be useful in improving the strength of steel. Nickel-alloy steels are known to produce a more adherent scale in rolling than plain carbon steels. Some manufacturers believe that nickel in steel causes difficulties in butt or lap welding and place a limit of a few hundredths per cent on skelp to be used for such purposes. It apparently does not adversely affect fusion welding.

Other manufacturers believe that chromium causes difficulty in butt or lap-welding of steel. Chromium forms an exceptionally stable carbide and also may go into the ferrite. Manganese behaves similarly to chromium, and in view of the large content of manganese in plain carbon steels, the effect of a variation of 0.10 per cent of this element may be as great or greater than that of a change in 0.02 or 0.03 per cent of chromium. Likewise, since a higher carbon content has a similar effect, the usual variation of this element in commercial steel may overshadow the effect of such a small amount of chromium. In view of the above-noted strengthening effects of copper, nickel, chromium and arsenic, it would be expected that the cumulative effect of high residual contents of each of these elements would confer markedly higher mechanical properties on steel.

In steels for some uses, chief among which is deep-drawing



Residual Metals in Steel. The average of 10 plants, based on capacity, is shown.

metal. The copper and nickel contents of the scrap were then estimated from ladle analyses of the finished steel. Results are given below:

influence on the surface of steel and should be kept to a minimum in rolled or forged steel. Any prob-

	Calculated Analysis of Scrap	
	Cu	Ni
No. 2 Scrap prepared by Dealer A	0.071	0.032
No. 2 Scrap prepared by Dealer A	0.102	0.044
Regular No. 2 Scrap from Dealer B	0.325	0.102
No. 2 Scrap from Stock Pile	0.333	0.084

In another test, 440,000 lb. of No. 2 scrap was sorted at the mill. The best scrap was used as the scrap charge in one heat and the poorest in another. The calculated copper content of the best lot was 0.21 per cent and of the poorest 0.52 per cent.

Unfortunately, there is little definite information available as to the effects of these minor amounts of metals on the properties of steel. Specifications have been set up to limit the content of certain of the residual metals in steel to insure good performance either during processing in the mill or foundry or in the use to which the customer puts it. Much prejudice exists against certain metals. Some of it is justified, but the entire subject deserves careful study. Enough information is at hand in some in-

able beneficial effect they may have on corrosion resistance is offset by their bad effect on surface and mechanical properties. Tin below 0.05 per cent apparently may be tolerated without affecting the surface, but above this content may cause trouble. Eight to ten hundredths per cent causes minute tearing of the surface of steel during rolling, having an effect similar to higher contents of copper. Tin contents above 0.1 per cent often cause serious surface checking.

Antimony acts similarly to tin. One mill reports that 0.03 per cent antimony caused no apparent difficulty but that 0.15 per cent could not be tolerated. The effects of tin and antimony probably are additive. The few experiments that have been made indicate that the

stock, the presence of ferrite-strengtheners may be highly objectionable. The requirements, especially of the automotive trade, for steel of better and still better deep-drawing qualities, have focused attention on this problem. Steel in which the carbon content has not been reduced to counteract the effect of the ferrite-strengthening residual metals may tend to work-harden under deformation, and thus not permit the severe draws required without breaking. By reducing the carbon content to compensate for the presence of ferrite-strengthening residual metals, it should be possible to make a steel of higher yield strength and higher ductility. Such a steel probably could be used for deep-drawing as successfully as plain-carbon steel, although the dies and hold-down equipment may have to be changed for it. Here again, the cumulative effect of rather large amounts of the residual metals is required to become effective. Other factors such as the character of the rimming action, and hence the content of oxygen and deoxidizing agents, have as important effects as minor changes in contents of the residual metals. However, until more information is available on the effects of residual metals on deep-drawing properties, mills will play safe and continue to operate

with low limits placed on the total content of these metals.

Copper, nickel, chromium and tin have been variously blamed for injuring deep-drawing properties. By setting a maximum limit on copper for deep-drawing steels, some mills believe they have definitely improved results. The maximum limit set, however, varies greatly. One mill has set the limit at 0.08 per cent, another at 0.12 per cent, several between 0.12 and 0.15 per cent, and some others at 0.20 per cent. The variation may be due to different requirements for deep-drawing stock. At any rate, by setting a limit on copper, the total content of residual metals is kept to a certain approximate minimum.

The principal value of maintaining a low residual-metal content in steel castings is to secure uniformity in composition to get the same response at all times to heat treatment. It should be as satisfactory to use a higher content so long as it is uniform and the heat treatment can be adjusted to give a satisfactory product. As one foundryman put it, however, there are so many variables in steel-foundry practice that elimination of this one by holding residual metals to a minimum removes one alibi and therefore is worth the effort.

When a plant makes a large

proportion of its steel to extremely low residual-metals specifications, it becomes necessary to make practically all of its steel to the same specifications. Otherwise, extreme care is needed to keep plant scrap of different compositions separate. The resulting low-alloy content puts some steel products, e.g., certain structural and forging grades, at a disadvantage in comparison with other steels not so restricted, because of the higher strength conferred by the residual metals.

It is costly to keep the content of residual metals to a low point, whether by better selection of scrap, use of a higher proportion of pig iron or other means. In general, the lower the permissible content of residual metals, the more costly the operation will be. Hence, it is important to determine the amounts of residual metals that can be tolerated in different grades of steel. Then, if it is established that a certain product, special deep-drawing stock for example, must have a definitely limited content of residual metals, the plant must adjust its practice accordingly. It may have to go to the additional expense of keeping a special pile of scrap, segregating its plant scrap and using higher proportions of pig iron. Another plant, which normally uses high ratios of pig iron and low-alloy scrap and makes all of its steel up to low residual specifications would be able to make this steel at no added cost. In such cases the integrated company with pure raw materials is at an advantage.

If it can be demonstrated that for such uses a high content of residual metals can be tolerated by adjusting carbon and manganese contents, then the producer that normally makes steel of high residual metal contents could take the business. In this case more attention would need to be given to maintaining a uniform residual-metal content, even though high. This would require the same kind of scrap in the same proportions to be charged in all heats. It may also mean even the addition of alloys to bring up the content of a low residual heat to the specification that was set up. That is, it may be better, for many uses, to keep residual metals uniformly high than to have them vary in content.

Residual metals are not increasing rapidly in steel, but they are bound to become more widely dis-

PIG iron manufacture in the mountains of central and western Pennsylvania was begun late in the eighteenth century. Native ores and charcoal were used, and the industry flourished during the first half of the nineteenth century. The remains of many of the old stacks may still be seen by motorists in the Alleghenies. From the collection of Irving B. Muller, of Johnstown, Pa., **THE IRON AGE** is reproducing in this issue a number of photographs of these interesting industrial landmarks. The Centre furnace, pictured in this illustration, was built in 1792, during Washington's first administration, by Col. John Patterson and Col. Samuel Miles, pioneer iron masters of the revolutionary period. Located one mile west of Lamonte, Huntingdon County, this furnace derived its ore from the Nittany Mountains.



seminated, making it more costly to maintain low contents except in plants that use only their own scrap. It is wise, therefore, to avoid as much as possible the building up of these adventitious metals in steel. Better preparation of scrap is essential. While it is difficult, and will become increasingly so, to avoid steel and iron scrap that contain these metals, there is no excuse for adding non-ferrous metals with the charges to the blast furnace or open hearth. Tin and antimony especially should be avoided, as they appear to have no possible advantages in wrought steel and they do possess serious disadvantages.

Thus, the collection and preparation of scrap become the most important considerations in this problem.

Kinds of Iron and Steel Scrap Available

The choice scrap is taken by the steel foundries and manufacturers of acid or other steel for those uses in which a low content of residual metals is desired. The heavy structural and railroad scrap is generally in the greatest demand, and it commands a higher price than the regular No. 1 scrap. The higher price received for this scrap should enable more expense to be put into the preparation of all scrap. Hence, the taking of this choice scrap out of ordinary No. 1 grade should make possible the better segregation of scrap into various grades as well as the elimination of non-ferrous metals. No. 1 scrap may contain lighter weight products free from automobile and other less desirable scrap, usually known as No. 2 scrap. There are various grades of No. 2 scrap, bundled and bushelling scrap of different degrees of quality, whose price varies but is below that of No. 1. In addition to its alloy content, such scrap is subject to more oxidation during melting and is more expensive to handle and charge. A still lower-priced material is steel turnings which oxidize more readily and require more difficulty charging than the larger sizes of scrap; they also may be contaminated with non-ferrous metals and high-sulphur steel.

Most cast iron scrap, except "direct metal," is lower in carbon, silicon and manganese and higher in sulphur and phosphorus than normal basic pig iron and so must sell for a lower price. So-called



THE Hannah or Laurel Mountain furnace was erected just below the Ross Mountain furnace in Westmoreland County, in 1810. It was in blast for but a short time, but is still in a remarkable state of preservation. The close-up clearly shows the details of construction of these early charcoal furnaces.



"burnt" iron scrap, grate bars and castings of thin section, either are higher in sulphur or undesirable in other ways and are still lower in price. Such scrap usually is not taken for open-hearth charges but goes to the blast furnace. Iron borings are a still lower grade, difficult to handle and readily oxidized.

Collection and Preparation of Scrap

The business of the collection, preparation and sale of scrap has become a sizable industry. Benjamin Schwartz of the Institute of Scrap Iron and Steel, says that there are approximately 1000 scrap dealers who maintain yards or places of business where scrap is gathered together. These may be termed the wholesalers of the in-

dustry. Many of these dealers handle other waste materials such as non-ferrous metals, rubber, rags and paper. In the larger centers there are scrap dealers that specialize exclusively in steel and iron. In normal times these yards employ about 50,000 people in the preparation of scrap. In addition to these, there are the collectors of scrap, the "peddlers," who with auto trucks or with wagons scour the country for waste materials. In good times as many as 150,000 people are engaged in this work. Their activity in iron and steel scrap depends upon market prices.

Iron and steel scrap thus collected goes to dealers' yards where it is prepared and sorted, sometimes passing through several hands before it is finally shipped to the consumer in carload lots.



FOUNTAIN furnace, constructed about 1810, was so located in the dense mountains of Westmoreland County that it was almost impossible to ship its products, and it was soon abandoned.

Mr. Schwartz estimates that normally about 25 per cent of the scrap (aside from that produced in iron and steel works) comes from this source. When prices are high, this scrap comes onto the market in increasing amounts. Thus, it serves to balance supply against demand and helps to avoid more violent swings in prices.

Assuming that 25 per cent of

the outside scrap is represented by this so-called country scrap and the balance by manufacturers' scrap, that the plant scrap amounts to 27 to 28 per cent of the ingots plus castings made, and that 90 per cent of the scrap charged is converted to ingots and castings, the relative amounts of the different kinds of scrap used in the basic open hearth would be:

Kind of Scrap	Per Cent of Scrap In Charge	
	50	60
Plant Scrap	50.0	41.7
Manufacturers' Scrap	37.5	43.7
Country Scrap	12.5	14.6

This method of calculation indicates that in 1934 when about 16,000,000 tons of scrap was used in the basic open hearth, 2,300,000 tons was represented by country scrap.

The yard dealer finances the small collector and the large dealer acts as a broker, who, through his knowledge of scrap supplies and his contacts with collectors and manufacturers, is able to fill promptly the steel industry's orders for large quantities of selected and prepared scrap gathered over a wide territory and from a variety of sources. Thus, he plays an important part in the steel business and is responsible for the proper selection, preparation and delivery of scrap that must meet the requirements of the industry.

For the most part, scrap is prepared either at the manufacturer's plant or in the dealer's yard, according to the specifications of the purchaser. This is a highly important operation. In the case of manufacturer's scrap, it is a relatively simple matter to keep scrap of various types separate and to prepare it in a manner suitable to the purchaser. So much miscellaneous material, however, comes into the dealer's yard that the problem becomes quite complicated, particularly in view of the great number of specifications under which scrap is purchased. A fully-equipped dealer's yard uses a "drop" for breaking large pieces of cast iron, a shear for cutting up large pieces of steel, an acetylene torch for cutting up bulky steel and a hydraulic compressor for making bundles of the lighter grades of scrap.

The United States Department of Commerce, as a result of the work of its Division of Simplified Practice, in 1928, published a Classification of Iron and Steel Scrap. This contains specifications which include and define eight different classes of scrap for use in blast furnaces, 26 classes for use in basic open-hearth furnaces, 17 for acid open-hearth furnaces, five for electric furnaces, 13 for iron foundries, three for Bessemer converters and two for miscellaneous, 74 in all. Some purchasers use these specifications, some use them



EAGLE or Curtins furnace, believed to be the first stack in the Bald Eagle Valley in Centre County. It was built in 1817, and receive its ore from the Nittany Mountains.

slightly changed, and some have entirely different specifications of their own. The American Railway Association has another set of specifications for railroad scrap which covers 37 different grades.

Once having established its specifications to fit its particular requirements, the steel plant must use eternal vigilance to get the kind of scrap ordered. Often due to ignorance or to mistakes or to carelessness, sometimes to deliberate top-dressing or "doctoring" of the cars of scrap, the steel plant gets scrap that causes difficulties. A car rejected by one company may be sent to another and to another until one is found that will accept it, usually at a lower price. By setting up high standards of ethics, the Institute of Scrap Iron and Steel has done much to improve this situation. Also, as a result of the steel plant's insistence, the dealer has learned that it pays to give good service. Some scrap contracts are so rigid that the purchaser can return an entire car of scrap if a single piece of scrap that falls outside the specifications is found in the car. Other companies have the power to reject a car if undesirable scrap is found in it so long as it is discovered before the car is unloaded. Some sort the scrap in their own yards, while others just pick out the non-ferrous alloys. One company pays the sorter for one-half of the value recovered from these alloys and several companies pay a bonus on recovered alloys.

Segregation and Use of Different Types of Scrap

The problem of the intelligent preparation of scrap has been made extremely difficult by the widespread use of alloy steel and the assembly of ferrous structures containing large amounts of non-ferrous metals. The modern automobile is an excellent example of this. In the automobile today we will find copper, lead, tin, antimony, chromium, zinc and nickel—all in sufficient amounts to appear in measurable quantities in steel made from the scrapped car. By careful preparation of the scrap, most of these elements when present as non-ferrous alloys can be eliminated. Many of them, such as chromium, nickel, and copper are alloyed with the steel or iron parts. The segregation of such parts requires an expert knowledge of the metallurgy of automotive mate-



BALDWIN furnace, in Westmoreland County, stands on the banks of Tub Mill Creek. Note its size compared to the man standing at the left corner.

rials. In addition, the development of the alloy steel industry is resulting in the use of structural and mechanical parts made from alloyed steel and iron that heretofore have been known as alloy-free. The segregation of these products demands expert knowledge and great care. The steel plant, itself, also must maintain rigid practice to avoid the mixing of its alloy steel return scrap in heats that are designed to be free from alloys, and

also to keep the alloy steel mill-scale separate and to avoid the picking up of alloys from the open-hearth bottom after an alloy heat has been made.

The increasing use of sheet and strip and of lighter-weight structures creates the further problem of using light-weight scrap. Thus, the steel industry as a whole will have to absorb scrap which may be considered undesirable, both because of its lightness in weight and



ROSS MOUNTAIN furnace, built in 1814 on Tub Mill Run in Westmoreland County, now belongs to the Ross Mountain Park Association. This furnace was in blast until 1855.

its content of alloying elements. Such scrap will necessarily be used by some one. Hence, it is important to adjust practice to make the most of it. If the scrap is properly segregated at the point of production or in yards where it is collected, the steel plant will be able to deal with the problem satisfactorily. To make the proper separation, more intelligence and more effort will be required. This probably will increase the total cost of scrap. The most desirable grades

The steel plant that uses important proportions of outside scrap will have to adopt, as many already have done, a scientific method of piling scrap to fit into the particular practice. For example, if a steel plant buys certain grades of scrap, a well-distributed mixture of which will give the desired composition and melting characteristics, it can require that all the scrap be loose and be cut to a small size; then all the scrap can be distributed through-

In the operation of many large steel mills today, although only a part of the steel must be made up to an extremely low maximum residual-metal content, the open-hearth department must be prepared to furnish such steel on short order. Also, segregation of plant scrap that will give low residual-metal contents may be impractical. As a result such plants must make up every heat to the same requirement, and so all scrap must be low in residual metals.

Where residual metals must be kept low, it is essential to avoid blast furnace scrap that contains alloys. Since this grade of scrap is available at a lower price than the customary steel-making grades, the natural tendency is to send the undesirable, small-size, alloy-containing scrap to the blast furnace. If the use of high pig iron ratios in the charge is adopted to reduce the residual-metal composition of the steel, it is essential that alloy-containing scrap and mill scale be kept out of the blast furnace mixture when making basic iron. However, in a large operation, advantage can be taken of cheap alloy-containing scrap and of plant alloy steel scrap for producing alloy basic iron to be used in making alloy steel.

In any case, it is highly imperative that scrap collectors, yard dealers, and all others engaged in the handling of scrap give more attention to the better segregation of scrap upon the basis of its alloy content, and to cooperate with the iron and steel plants in finding the most economic outlet for all grades of scrap. It is equally important that the steel plants adopt the best practice for stocking scrap so as to take advantage wherever possible of its content of alloys, to avoid alloy-containing scrap where necessary, and to determine what grades of steel can stand or be benefited by the small amounts of residual metals that will be obtained from the average scrap and to adjust practices accordingly.

The yard dealer must advance his art and his control so as to better segregate high and low alloy-bearing scrap and to better eliminate non-ferrous alloy parts from the steel scrap. If he will not do it, the steel plant will have to, and if it does, the scrap man will have to pay for it. The more the dealer relieves the steel mill of preparing the scrap it purchases, the more assurance he will have



RITTERS or Eliza furnace was built in 1847 about the time more modern methods of manufacturing were coming into use. This furnace in Cambria County was soon abandoned.

will have to carry a relatively higher price and the least desirable, a correspondingly lower price than is the case at present.

Although many operations now demanding low-alloy scrap probably could get along without such strict requirements, it is doubtful whether there will be a change very soon. On the other hand, many alloy steels can be made from scrap in which the presence of residual metals (except tin and antimony) will be advantageous. For many uses, the scrap of highest alloy content can be used to make steel of improved physical or mechanical properties, or the residual-metal content can be supplemented by alloy additions to make up the required alloy contents. Such practice will help pay for the cost of segregation.

out a pile or a car in order to insure a good mixture. The furnace requirements can be drawn from such piles with assurance that the scrap charge for each heat will be uniform in composition and character. Where this method cannot be used, several piles of scrap can be maintained, each one having constant and known composition. The scrap charge can then be made up by taking definite percentages of it from each pile so as to insure a uniform mixture, and hence, the same melting characteristics and alloy composition in each heat. The picture at the beginning of the article illustrates this method of piling. For heats that require an extremely low content of residual metals, a special pile of scrap of low-alloy content, purchased under rigid specifications, can be kept.

that the mill will not extend its operations in this field.

The problem of residual metals resolves itself into first knowing what limits in composition are required for satisfactory mill practice and performance in use, and second, in adopting the necessary procedure in the preparation and use of scrap to secure the desired results. It is largely a matter of good housekeeping, knowing the composition of different scrap, eliminating undesirable material, and keeping alloy scrap separate. Alloy-free scrap should be used when residual metals must be kept low, reserving the alloy-containing scrap for steel that is not required to be low in residual metals.

Summary

Study of the economics of the production and consumption of steel indicates that sufficient scrap will be available to supply the needs of the industry at about the rate of consumption that has prevailed during the past 10 or 12 years. Increased demand in times of high production will bring out more scrap and this with the large existing pig iron capacity will tend to prevent a scarcity of scrap. The trend will be toward an increasing proportion of light-weight scrap that will contain high contents of the residual metals and will be contaminated with non-ferrous metals and alloys. While the average residual metal content of all scrap may not rise rapidly, these metals will become more widely disseminated in all scrap.

Increased attention will have to be given to the proper sorting out of non-ferrous metals and to the segregation of scrap of low and of high alloy content. The plant that uses little or no outside scrap will be able to continue to produce steel of low residual-metal content, but it will have to pay increasing attention to the elimination of alloy-containing raw materials in the charges to the blast furnace and open hearth, and to the segregation of plant and outside scrap that contains alloys.

The plant that uses relatively large proportions of scrap will have to see to it that its scrap is properly sorted for non-ferrous metals and suitably prepared to give known and uniform residual-metal contents. A system of piling or of buying scrap, if it is used direct from cars, should be adopted so that the entire supply will be



BUENA VISTA or Blacklick Creek furnace—A park is being built around this historic landmark in Indiana County to perpetuate the early struggles of the pioneers in that region. It was constructed in 1820.

uniform or that various grades can be mixed to give charges uniform physically and in residual metal.

Plants that have difficulty in making steel of the low residual-metal content required for specific uses will have to use higher proportions of pig iron in the charge. But except in these instances, steel of satisfactory quality will be made from high charges of scrap, in which the content of residual metals will be quite high. In this case,

uniformity of the residual metal content rather than the amount is the important factor.

For economy in raw materials and operating costs, the content of residual metals should be restricted in only those steels where it is absolutely required. Then practices can be adjusted to produce and use steel of high residual-metal contents, and the lower grades of scrap can be used to maximum advantage.



McCOY's furnace, located between Milesburg and Bellefonte on United States Route 220, is readily accessible and is an excellent example of early Pennsylvania iron making practice.

Can Tool Steel Be Merchandised?



THE steel industry has been accused of being production-minded and not at all merchandising-minded. And yet, since the early days of the depression when demand from its principal markets, railroads and construction, virtually dried up, the industry has done an outstanding job in developing new uses and markets for steel and its alloys. That, to my mind, is merchandising.

One of the bedrock functions of a merchandising unit in a sales department is that of studying customers' special requirements and the adaption of, or creation of, a product to meet those requirements. The tool steel industry, without benefit it is true of formally organized merchandising departments, has nevertheless been performing that bedrock function for many years. I know of no industry which is closer to the special needs of customers, or which goes to greater lengths to meet those needs, than the tool steel industry. Again, to my mind, that is merchandising.

My answer, therefore, to the question, "Can tool steel be merchandised?" is this: Tool steel *is* being merchandised. Whether it is being merchandised up to the hilt of the somewhat limited possibilities in the tool steel field depends on definitions.

"Merchandising" is an American connotation of a good old English word which the standard dictionary defines simply as "mercantile business." It grew up along with the extensive development of advertising in this country. It has had its widest application naturally in terms of resale-products which must move smoothly through channels of distribution and eventually off the retailer's counter. For such

products it became so closely allied to advertising that advertising agents refer to their business as that of Advertising and Merchandising.

But what is merchandising? Ask ten advertising specialists and you will get ten different definitions of merchandising. These definitions will, however, simmer down to what I would call *planned selling*, as a root-definition, on which all ten advertising men would probably agree but with the proviso that the planned selling should be expressed and extended by a sales promotion campaign.

In other words, merchandising in principle is planned selling, and in practice is a sales-promotion or merchandising campaign. One authority defines it as follows: "Merchandising is sales promotion in addition to the work of the sales-force but coordinated with the selling. It is usually supported by some form of advertising, in which case the combined sales-and-advertising effort is synchronized. It may be based on a central talking point of a product or line of products; or on some feature which adds to the efficiency, attractiveness or convenience of the product or its package; or on some special process or technique of the manufacturer which makes the trade or the consumer think the product may be better and therefore disposed to try it. It is planned, organized and coordinated sales promotion."

Tool Steel Not a Resale Product

Some such definition as the above is probably in the minds of tool steel manufacturers who have asked themselves the question, "Can tool steel be merchandised?"

There is justification for an element of doubt as to whether

planned selling of tool steel can be developed and extended into a profitable *merchandising campaign*. For the tool steel business, like all business but more so than most, is different.

Tool steel, as such, is not a resale product. It is bought and used for conversion into dies and cutting tools by diemakers, toolmakers and manufacturers, who are the consumers. The only time factor in how long the product stays on the stockroom shelf is the condition of the customer's business, over which the tool steel manufacturer has no control.

Tool steel has no taste-appeal, eye-appeal or style-appeal; it is its own package; its function is purely utilitarian and its identity submerged in the finished tool or die.

The tool steel market is highly diversified and inclusive. Practically every manufacturer, large or small, uses some tool steel.

Small customers are in the majority. One of them may buy a few pounds of steel, and having no facilities beyond a blow torch and a pail of water, may take a half-day of a salesman's time for advice as to proper use of that steel. Yet they should be covered. Small customers, like obscure employees, have a way of coming up through the ranks to prominence. Their loyalties are valuable.

The product is right or it is wrong—there is no middle ground for the large customer with a testing laboratory any more than there is with the small customer who doesn't get satisfactory results, even though his technique, not steel, is wrong.

The customer is the consumer and the consumer is king. There is a widespread consumer-preference for certain long-established brands of tool steel, but it is a preference

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By A. T. GALBRAITH
*Vice-President, Crucible Steel Co.
of America*

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that will not stand against results, nor is it powerful enough to displace a good steel plus good service plus a good salesman.

For it is fair to state that the average user of tool steel, large or small, is not prone to change his source or sources of supply so long as the product and service are satisfactory. By service is meant getting his steels when he needs them; getting improved steels as they are developed by the industry; and getting technical help when in trouble.

Object of Merchandising

There are just two ways to increase sales—one is to sell to more customers—the other is to sell more to present customers. A profitable merchandising campaign must accomplish one or the other, or both, of these objectives at a cost which leaves a profit on the operation.

I have already said that I believe tool steel can be, and in fact is being, merchandised to some extent. The question, to my mind, is how far merchandising principles can be applied to tool steel selling with profit.

Since a merchandising operation is predicated on planned selling it follows that a tool steel manufacturer must consider merchandising in terms of his fundamental approach to the market.

Does he, for example, plan to serve manufacturers in certain territories only, or throughout the United States? Is his sales force adequate in personnel to contact with sufficient frequency his best customers and prospects? Is he willing to make the necessary investment in warehouse stocks with properly regulated and maintained inventories to meet the demands of each particular market? Is he

equipped to produce all the types and grades required to serve the market, or does he specialize, thus cutting down inventory investment but sales potential as well?

Intelligent sales-planning is contingent upon definite and carried-out policies in respect to the above marketing factors.

Steels must be accessible and ready for delivery. A diemaker with a rush order must get his steel immediately from a nearby warehouse stock or go elsewhere for it.

I believe that an efficient and extensive warehouse and branch office organization is a prerequisite to a profitable merchandising operation on a national scale. A wide variety of types and grades of steels is necessary if the full benefit of the merchandising is to be realized. Finally, a large sales force is required adequately to complement a campaign in a market as diversified as that to which tool steel can be sold.

Accessibility Essential

In short, the most fundamental form of merchandising tool steel nationally is to make it accessible and available on short notice. It stands to reason that a manufacturer with the only established stock in a given city will, other things equal, secure the lion's share of the business at that point. It would seem logical for such a manufacturer further to merchandise his product in that territory since he offers a special service and convenience.

The tool steel industry has done a good job in developing steels for special requirements, which I contend is a basic form of merchandising.

Further developments in mer-



A. T. GALBRAITH

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chandising, if practical from a profit standpoint, might well be along lines of encouraging and developing new uses of tool steel, and cutting down the sales-cost of covering small customers. Wherever a tool steel manufacturer maintains a warehouse stock there is always an opportunity to amplify by some form of merchandising the work of the salesman, particularly with small customers who may be called upon not more than twice a year. In the tool steel business the aggregate sales to small customers can be profitable.

Can tool steels be merchandised in the usual acceptance of the term as applied by makers of tooth paste, shaving cream, safety razors, breakfast foods, radios and motor cars? Probably not. But that they can be merchandised along fundamental lines of sales planning has already been demonstrated; and in line with increased activity in merchandising and advertising throughout the entire steel industry it is probable that merchandising in principle and practice will be increasingly applied to tool steel selling also.

Advertising's Place in Marketing of



FOR a score of years, merchandising and advertising specialists have made use of the public platform and the trade journals to criticize steel manufacturers for their lack of a complete understanding of the value of advertising in the merchandising of basic steel products. With a few outstanding exceptions this criticism has been sound.

The industry generally has suffered much from a "my-business-is-different" epidemic—different from cement, lumber, copper, brass, brick, aluminum and plastics. In recent years and increasingly in recent months there are indications which justify the belief that the epidemic is waning. As business improves more advertising of basic steel is appearing in trade, business and technical papers, and—where it has been particularly noticeable—in general circulation magazines.

It is not true that steel manufacturers have ignored advertising altogether. Some companies, shunning publication advertising, have made use of catalogs, handbooks, booklets, folders and envelope stuffers. Others have included trade, technical and business papers in their activities. All of this might be termed product advertising. Institutional advertising on the other hand has been practised only to a limited extent and by a comparatively few companies. It is in this latter field that new activity has been registered in recent months.

There is good reason to believe that advertising's place in the merchandising of steel is not as clearly defined as it might be. This is to be expected since it is a relatively new and heretofore minor activity with so many units in the industry. In all likelihood experience will pay its part as time goes on and steel advertising will be given its proper role.

A JOB TO BE DONE IN STEEL

DESPITE increased merchandising activity on the part of individual steel companies, there still remains an important job to be done by the steel industry as a whole—a job that no one company can afford to undertake alone.

The advertising and merchandising programs of individual companies, for the most part and of necessity, have for their purpose the garnering of a larger share of the already existent market. Little or nothing is being done to expand the market as a whole and thus to relieve competitive pressure resulting from a great excess of producing capacity.

This is an activity that must be financed cooperatively by all steel companies. It entails scientific research, market research, product development, sales promotion and advertising. It calls for an unselfish family spirit and an appreciation of the commercial battle of industry arrayed against industry rather than the internecine competitive warfare between various units within a given industry.

Until a united steel industry acts on the realization that present markets must be guarded and new markets developed, it is ignoring its greatest opportunity for industry advancement.

Not all steel advertisers have been fully sold on the value of their own advertising. The result is that it has been more of a fair-weather activity than in some industries. Some have engaged in advertising because their competitors started it. Such efforts are half-hearted or less. They do the company no good, the industry no good and the art of advertising considerable harm.

The manufacturer of boots or shoes or sealing wax who goes into advertising because, as he says, he is forced to by his competitors, looks upon it as an unnecessary expense, dallies with it in fair weather on an "in-and-out" basis and drops it at the first sign of a storm. There follows his firm pronouncement that "advertising doesn't pay." Those who haven't tried it feel secure in heeding the sage advice of one who has, because who should know better?

Then there is the manufacturer who confines his advertising to college annuals, programs for church theatricals and an occasional and supposedly influential local political organ. Yes, he calls it advertising, but with a knowing air informs his fellow club members that it "is all the bunk. Just a sweetener, you know."

"Where there is sufficient pressure, advertise," seems to be the standard established by some. If a good customer requests it and happens to make pointed reference to the sizable tonnage purchased during the last year, the decision is "yes." What would happen if all good customers asked the same consideration is either overlooked or purposely put out of mind. Besides, he made sure to caution the recipient to keep real quiet about it, and that fixes it up all right.

Occasionally there is a manufacturer who will "run an ad or two"

By **STANLEY A. KNISELY**

*Director of Advertising, Republic
Steel Corp. and Subsidiaries,
Cleveland*

in order to get a customer away from another manufacturer, or to hold a customer already on the books. In such cases, and they are few, there seemingly is no fear of establishing a practice that may quickly grow beyond all bounds and no realization that he has hit upon just another method of "under the table" price cutting.

Still another type of advertising is designed to serve as a "pat on the back" to large consuming industries. It might be termed "reciprocity advertising." Thus a manufacturer of buttons might advertise "Buy an Extra Pair of Trousers" to demonstrate how very interested he is in helping the men's wear industry to sell more trousers and thus sell more buttons. But, here again arises the problem of doing for one or a few what you cannot do for all. How interesting if all button manufacturers were to follow suit.

If one were to survey 10 manufacturers of automobiles to ascertain the proper place of advertising in the selling of motor cars, chances are he would find a unanimity of opinion. Ask 10 steel manufacturers what place advertising occupies in merchandising steel and replies probably would vary considerably.

Even back in the days when steel was steel—hard, mild or soft and take your pick—there was reason for some advertising. If a manufacturer wanted to let potential users know that he made such steel and in less time than it would take his sales force to cover all prospects, he advertised. Such adver-

tising frequently took the form of one-eighth or one-sixteenth page announcement cards, but large or small, it did serve a purpose.

When a manufacturer departed from the regular line and wanted quickly to inform the market of a new steel product, he advertised. As more and more specialty products were developed by perpetually searching metallurgists, advertising increased. As producing units grew larger and more complex the need for advertising even plain carbon steels became evident.

Wider spread and constantly changing markets did much to bring further appreciation of advertising to the steel industry. Personnel changes alone among customers and prospects pointed to its necessity.

So today there are an increasing number of steel manufacturers using advertising and using it legitimately. They know what it can and what it cannot do. They know what it has accomplished in the industry in the past and what reasonably to expect of it in the future. For illustration:

Not a Substitute for Salesmen

They know how one company has popularized its brand of enameling iron, how another has gained wide acceptance of its spring wire, how another has become famous for its alloy steels. They know that the merits of stainless steels are appreciated by more consumers today than it would have been enocomically possible for salesmen to search out in so short a time. They know that the comparatively new low-



STANLEY A. KNISELY

alloy, high-tensile steels have gained a surprising following in only a few brief months.

Finally, they appreciate that the proper place of advertising in the merchandising of steel is to inform favorably more prospects about the merits of their respective basic steel products in less time and at less expense than would be possible by any other means. They look upon it as a sales help and not a substitute for salesmen.

They know that advertising cuts the cost per call, that it calls more regularly, calls on more prospects, calls upon *all* the buying influences in a given company, calls on the *new man* on the job, goes over the heads of sensitive junior officials without offense, produces leads for salesmen, helps to build an enthusiastic, prideful sales force, introduces the salesman to prospects and helps to get him an audience, saves the salesman's time by doing some of the elementary missionary work with the prospect, and serves to attract the better dealers.

Lastly, they know that it helps mightily to build prestige or goodwill and that goodwill is a priceless asset. What price would their owners place on some of the better known trade names in the steel industry today?



At the Crossroads of Business Life



MR. EXECUTIVE, do you work for the telephone on your desk or does it work for you?

How much respect does it have for a conference, dictation, a consecutive thought? If it fails to operate as an intelligent tool, you should investigate its lack of efficient application. Directly responsible for all contact between you and the outside world when you are in your office is the switchboard operator and receptionist.

Did it ever occur to you that this one person within your office holds

By MARGARET R. RUTH

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a more intimate reign over your business activity than you possibly could? Cashiers are usually carefully covered with a bonding arrangement. Subtle misappropriation in this other position of trust within your organization could be more far-reaching in its disastrous result.

This combination and key position is the most confidential one in your office. You may protest that truly important matters are not discussed coherently over the telephone. Think again of the possibilities telephone conversation in your own office would offer a designing operator. Confidential price discussions; company policy concerning either employees or competitors; any contemplated move possible in the realm of your own business world. The suggestion is wry, but the possibility is based on the fact that it has been and can be done.

Therefore, the qualities of absolute honesty and loyalty are imperative.

Tactful Treatment of Customers

You entrust your business affairs to the integrity of an operator, therefore you should be sure she is intelligently efficient and tactful enough to handle your customers and friends who contact your firm. Think for a moment. Does she reflect your personal solicitous consideration of them? Or, does she perform as a part of the equipment she operates? The latter being true, you as her superior have muffed an opportunity alive with possibilities for sales promotion. Is this filter process through the switchboard operator and receptionist rendering you the utmost in presenting a susceptible sales prospect? Failing to make the entrée to your order desk smooth and pleasant, you actually reduce the percentage of order producing contacts made by your salesmen. Your receptionist's responsibility is to reflect the cordial "at your service" which your contact men sell.

Exhausting the possibilities of this key position, consider for a moment the qualifications necessary to meet the variety of situations arising. The range is from customer contact to mill. Shoe string salesman to insurance agent. Sheltered in the guise of business relationship, all deserve the same treatment, courteous and prompt dispatch.

For example, a prospective customer courted with promise of superior service and quality decides to carry out the salesman's suggestion. The telephone is his means of introducing the initial inquiry. The immediate responsibility for further contact lies directly with the operator. Will she by curt reply or gross negligence corrupt the impression of service created by the salesman? If the party the buyer calls is busy, will she let him dangle unconsolated so long that he will redial? Will she carelessly connect him with the wrong department necessitating a troublesome transfer? Will an awkward manipulation result in a cut-off? These various ailments of ordinarily healthy telephone communication are magnified by the fact that such a contact is the most sensitive connection in the world. By telephone, there is only a voice to soothe the irritated nerves, with the possibility of inflection to misconstrue a

"GOOD MORNING, MR. SMITH!"

LET us suppose that Mr. Smith is your largest customer. A car of steel which is badly needed at his plant has been unavoidably delayed. He may not be in the best of humor. But if your switchboard operator recognizes his voice, greets him cheerfully and connects him immediately with the person he wants to talk to, it helps a lot.

The author of this interesting article is just that sort of an operator and receptionist. She is employed in an important district office of a large steel company. She has made countless friends for this company because she has made it her business to know her job well. Perhaps she knows it better than many of those who employ girls in this very important capacity at the crossroads of business life.

good intention. These details of operation, improperly managed, may prove disastrous to a delicate inquiry which otherwise would become an order.

Plant Contact

The inquiry made, will contact with the plant be hampered by mishandling and carelessness? Will misunderstanding and bad temper stand in the way of a speedy reply? Again, all this behind-the-scene activity is important only when it does not function smoothly and efficiently. You in authority owe your switchboard operator 100 per cent backing on the established principle of "service" if that is your accepted theme. An operator is "in the middle" on the score of sales versus operation. A complete understanding or standard policy will eliminate strife and ease a readily aggravated situation.

Granted that a quotation has graduated to the order state, the ideal procedure from then on is equally important. As early as an operator is positive she recognizes

his voice, a cheerful "How are you, Mr. Smith?" is both arresting and flattering. In conversation you may recall hearing the generous comment about an operator, "she always knows my voice." There is a satisfaction in knowing you are not just another call.

The qualities of alertness and tact are called into play in a more concentrated fashion when it becomes necessary to delay completing a call. If, for example, a person has not the information for a specific individual, an operator may be obliged to inquire "who is calling, please?" If this is unusual for the individual, she may by way of apology explain that the person sought has left the office for a short while and left a message for someone, obviously not the party calling, thus tactfully and satisfactorily allaying suspicion of evasion. Again, if the operator is not sure the person called is willing to talk and his line is busy, "he has stepped out of his office, may I call you back" will gracefully acknowledge nothing and allow for what otherwise might result in further complications. It is unforgivable for an operator carelessly to permit a call to reach anyone in an office without warning him of a message delivered about a first person enquired for. Quick thinking and tactful action on the part of an operator can almost always save an awkward situation.

Understanding Human Nature

In the business world, a receptionist means a tasteful appearance, a ready smile and a comprehensive understanding of human nature. This last quality is of the utmost importance because all those who enter her realm do so with a deep sense of the importance of themselves and their problems, regardless of their missions. It would be extremely poor business psychology to belittle this fact. If he be a customer, he has good reason to believe he is essential to your firm. A genuine attitude of sincere and flattering attention as to his further contact within the office, puts him at his best and he will appreciate that fact. Sometimes it will be a girl's difficult job to satisfy a customer with the office manager instead of the president. This often presented problem challenges the sustained ego of the man in question and it is within the power
(CONCLUDED ON PAGE 108)

Fiftieth Anniversary of Invention of Resistance Welding Being Observed

RESISTANCE welding plays such an important part in the production of so many products in common use today that it is hard to believe that this well-known process of joining metals did not exist before 1886. Yet it was not until March of that year that Elihu Thomson, the inventor, applied for basic patents on his "Thomson process of electric resistance welding."

The first welder was a crude device — little more than a simple transformer fitted with a clamp and a pair of electrodes—and while it was extremely limited in the size and type of work that it would do, there was no doubt about its ability to join metals quickly and effectively.

Whether it was because the advantages of the process were readily apparent or because industry was beginning to look more favorably on new developments, resistance welding was adopted much faster than most inventions of such importance. Just two years after inventing the process, Elihu Thomson founded the Thomson Electric Welding Company to develop the process and to manufacture and sell the machines. Within a few years, resistance welding was in common use in more than a hun-

dred applications. It is interesting to note that the wagon and carriage industry and the bicycle industry were two of the first to make general use of the process. Today we could list page after page of resistance welding applications in the automotive industry alone without completing the list.

Welding pipe, fixtures, and hardware for refrigerators was another early application of the process. Today ice, gas, and electric refrigerators are made almost entirely of metal, and the number and variety of resistance welders required to produce them rival those in the automotive industry. It is estimated that the economies made possible by resistance welding methods save the consumer from \$35 to \$75 on the cost of a new refrigerator.

Not only have the number and varieties of welders used in these industries increased tremendously in the past 50 years, but hundreds of new products have been developed which require some form of resistance welding in production. Many of these are things that we regard as indispensable necessities in our daily lives.

For example, most lamps used in the home are resistance welded, and even the tungsten filament in the electric-light bulb is flash welded to the lead-in wires. Stainless steel knives are flash welded to mild steel shanks, which, in turn, are embedded in synthetic plastic handles. The monel metal sink is flash welded, and the monel or Everdur tank in the basement that supplies hot water to the house is seam and spot welded. The electric or gas range is assembled by welding. The stainless pots, pans, and trays are spot welded in many places. The

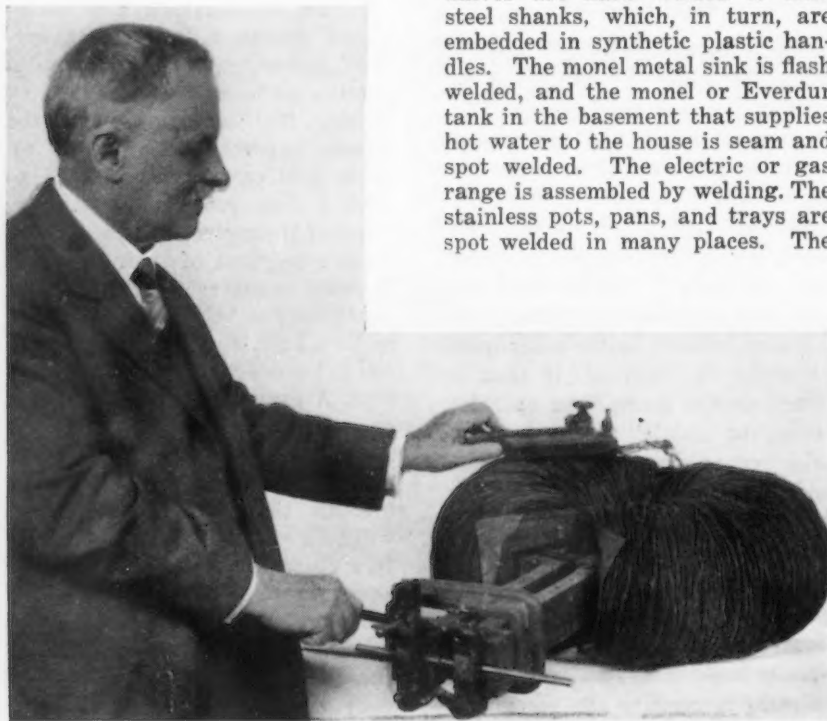
vacuum cleaner and the electric washing machine have their share of resistance welding.

The toaster and the electric percolator are spot and projection welded. The radio assembly is welded in many places and may have all-steel tubes. These tubes are a recent development made possible by resistance welding equipment.

The typewriter is spot and projection welded in many places. So are cash registers, comptometers, mailing machines, duplicating machines, metal desks, filing cabinets and other office furniture that help transact business. In the shop many of the tools and parts of the production machinery have been assembled by some form of resistance welding.

One of the most recent and certainly one of the most interesting resistance welding developments from the point of view of the metal working industries, is a flash welder designed for welding sheet steel in steel mills. It joins the single sheets produced in the hot rolling mills into a single continuous strip that can be pickled and finished without waste and with far greater uniformity.

To have contributed one invention half as far reaching in its effect on manufacturing methods as the Thomson process would have been an outstanding achievement for any man. It gives some indication of Professor Thomson's genius to know that he is responsible for the development of hundreds of electrical devices of every possible type, including generators, motors, lamps, lightning-arresters, circuit breakers, meters, switches, welders, insulators, transformers and countless others. More than 700 patents in the United States alone relate to his work. As a result of these inventions and in tribute to his scientific work, Professor Thomson has been distinguished with scores of medals, honors and degrees, both in this country and abroad.



Formerly the outstanding exporter of iron and steel products to Chile, the United States was succeeded this year by Germany, according to reports from Government officials in Santiago. The German gain resulted from the combined effect of German and Chilean exchange control and compensation treaties in force between the two nations. Tin plate, rails, sheets, bars and shapes are generally supplied Chile by America, but in 1935 lower sales were reported in practically every item.

Steel Lasts Longer as Knowledge Grows

—Average Life Now 32 Years

PROGRESS in manufacturing, fabricating and preserving steel has steadily added to its life, so that the average useful service of the steel used in this country is now more than twice as long as it was 50 years ago.

The 34,000,000 tons of steel produced last year may be expected to last an average of 32 years, the American Iron and Steel Institute has calculated.

In contrast, the output in 1885 of less than 2,000,000 tons of steel, consisting principally of rails, probably served an average of about 15 years before the railroad trackage and other goods into which the rails and the various other steel products went, became obsolete or were destroyed by rust or other causes.

From 1885 to 1915 the average life of the steel used in this country increased at a nearly uniform rate. During the war, no increase was shown because a great quantity of steel was exported, its period of useful life in the United States ending when it was shipped abroad. In the years since the war, however, a period in which great advances were made in both the manufacture and use of steel, the average length of life has greatly increased.

Among the advances in steel manufacturing technique which have been most important in increasing the average life of steel is the development of alloy-containing steels, some of which materially slow down attacks by rust or postpone such attacks almost indefinitely. Still other alloying elements make steel stronger and more durable.

The fact that steel manufacturers are succeeding in their efforts to eliminate as many as possible of the impurities which weaken steel and make it susceptible to rust has also tended to increase its average life. Furthermore, the steel industry has greatly increased the life of many of its products by developing and improving processes for coating steel products with tin and zinc and other materials which are much more resistant to corrosion.

Steel's average life has been lengthened also by the fact that a very important tonnage of steel is used in construction along with other building materials, which help to sheathe it from the elements. Furthermore, a large amount of steel is now in service underground, in pipe lines and building foundations, for instance, where corrosive attack is generally less severe than in the open air.

Great strides have also been made in the development of rust resisting paints, enamels, lacquers and other coatings for steel, both decorative and utilitarian. Automobile body finishes, for example, resist corrosion much better than

formerly, while coatings for exposed steelwork, as in bridges, likewise have improved rust resistance.

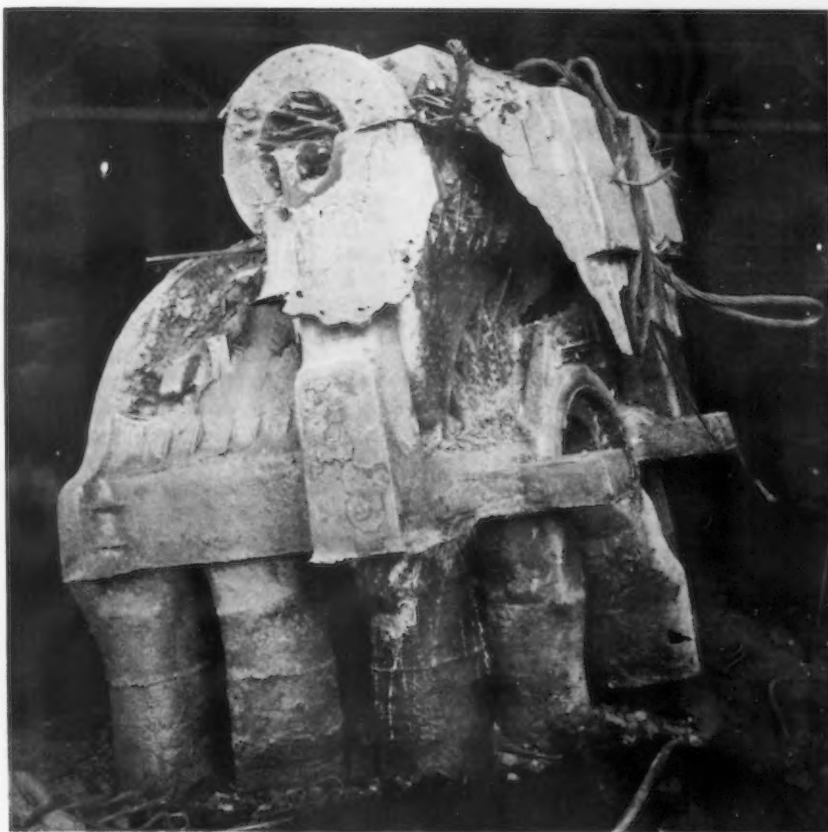
Perhaps most important of all, the factors which have extended the average life of steel are the refinements in steel manufacturing processes and the rigid tests which steel products must pass before leaving the mills. High quality is assured, resulting in fewer failures after the steel is put to work.

Applications of hydraulic power from early times to its present use in plastic molding and in the forming of metals was outlined by Walter L. Tann, hydraulic engineer, Farrel-Birmingham Co., Inc., Ansonia, Conn., at a recent meeting of the Providence Engineering Society. The subject of Mr. Tann's paper was "Hydraulic Presses and other Applications of Hydraulic Power."

A Steam-Driven Elephant

DESPITE its resemblance to an elephant or some beast that roamed the earth in prehistoric time, the "monster" is in reality only the outer high-pressure shell casting of a steam turbine. The photograph was snapped in the General Electric works immediately

after the casting was removed from the mold—before the cleaning, trimming, and machining operations necessary to make it a part of a powerful turbo-generator set had been performed. The turbine will be a 40,000-kilowatt unit when completed.





THIS WEEK ON THE ASSEMBLY LINE



... Production declines as Ford goes back to four-day week.

o o o

... Chrysler pay increase interpreted as move to keep several jumps ahead of any possible organized effort of workers to make this a rallying point for united action.

o o o

... Third quarter cited by steel makers as best period to raise prices, as far as automotive buying is concerned.

o o o

... Fisher bodies will be all-steel in 1937.

DETROIT, May 26.—First definite signs of slackening of automotive production were noted last week when Cram's Reports indicated a drop in the total output of the week to 109,821, as compared with 117,156 for the previous week. This is still 9000 units above the corresponding week of 1935, however. The biggest factor in this decline was the return of the Ford Motor Co. to a four-day-week schedule, after 11 weeks of operation on a five-day basis. Ford's production decreased 5200 units for the week. There were also declines in volume of approximately 1000 units at both Plymouth and Chevrolet, although cars in medium-priced classes, such as Studebaker, Hudson and Buick, held up to former levels. A factor in the Ford situation is that dealers are well-stocked with cars, and it is felt that the peak of spring sales has been reached.

It is understood, on the other hand, that Chevrolet plans production at a relatively high level through the end of July. After that time it is expected that there will be a rather drastic curtailment in production, as mechanical changeovers get under way for new models. In fact, most automobile plants will be down for at least three weeks, and in some cases the period of shutdown for plant changeover will be as high as six weeks.

Latest estimates of April registration of passenger cars by R. L. Polk & Co. would indicate that approximately 350,000 units were sold in the United States during the month. If this is the case, the figure will exceed the April, 1935, number by 30,000 units and will represent the highest sales month since 1929. May figures should not be much lower.

Used cars are selling at a good rate at the present time, as would be expected, since this is generally the peak month for such cars. Chevrolet is putting great pressure on its dealer organization to reduce used car inventories by at least 15 per cent during May and June. Chrysler dealers reported the delivery of 34,633 used cars in April, the largest number ever disposed of in such a month. Stocks in dealers' hands, although numerically higher than a year ago, are reported at about 5½ weeks' supply at the current rate of delivery. Used car inventories of Ford dealers in Detroit are reported high at the present time, and it appears that some carry-over is inevitable.

Dealer Situation Unsatisfactory

The dealer situation in Detroit has not been an entirely happy one in the last few months, despite the fact that sales have been at a record peak. More than one important dealer has been forced to the wall due to losses on used car turnover. Dealers of cars in the lower-priced brackets, particularly, are looking to a rather tough four months ahead, as the summer doldrums in sales are approached on both new and used cars and customers begin shopping around for discounts on new cars and high allowances on used ones. If there ever was a case of profitless prosperity, local dealers seem to be going through it now, and they are in a rather restive and belligerent mood as they regard the first quarter earning statements of some of the large automobile companies.

Not only do dealers eye manufacturers' profits, but labor leaders also are concerned. In industries where labor is well organized, it is not uncommon to have a dele-

By FRANK J. OLIVER
Detroit Editor, *The Iron Age*



gation walk into the front office the day after a large earnings statement is published. While there is no such thing as a truly organized labor movement in Detroit, nevertheless there are the makings of such a movement in the picture at the present moment. It has been the policy of the large manufacturers to anticipate desires of workers that might form a rallying point for group action. About two years ago, for example, the manufacturers largely abandoned group bonus and group piece work in favor of the straight hourly wage. Although no public statement was ever made to this effect, it was taken for granted that the move was made largely to placate unruliness among workers on the piece-work system, heard through the channels of works councils and other employee representation plans.

Chrysler Increases Wages

This leads up to the comment that last week the Chrysler Corp. announced pay increases for shop employees of 5 per cent, totaling approximately \$5,000,000 to \$6,000,000 per year. This will mean that on the average a worker will get 4c. more an hour than he was heretofore paid. This is the third hourly rate increase that Chrysler has given. In August, 1933, hourly rates were increased 20 per cent, and another 10 per cent increase was made in March, 1934. The present move makes hourly rates well above those in effect in 1929. As a matter of fact, the effective wage level is much higher, since living costs in Detroit are 15.7 per cent lower than those of 1928-29, according to a report of the United States Bureau of Labor Statistics. This third wage increase falls within a few weeks of Chrysler's

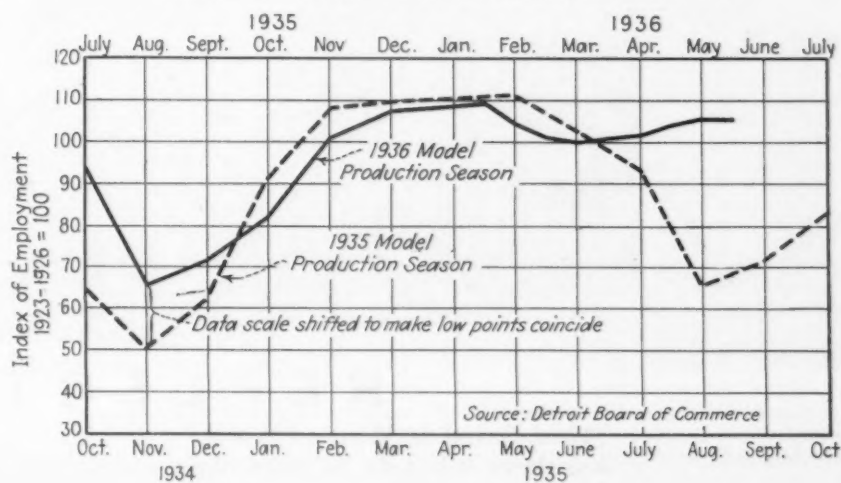
first quarter statement showing a net profit of \$11,453,439, more than \$2,000,000 higher than earnings in the first quarter of 1935.

This move on the part of the Chrysler organization leads one to wonder whether similar moves may not be made by General Motors and Ford. General Motors also showed an impressive first quarter statement, indicating earnings almost double those of the first quarter of 1935. Whereas Chrysler followed General Motors' example of giving a Christmas bonus to its workers, Ford Motor Co. stood quietly by. Not many months ago W. J. Cameron declared, in one of his Sunday evening talks, that the Ford plan is to give more wage increases, not bonuses. "We could at any time get ourselves hailed as philanthropists by giving a bonus of a few million dollars; last year the company gave wage increases to the amount of \$12,000,000 in eight months and no one thought it extraordinary," he declared. It should

not be surprising, therefore, to see a move made in the direction of increasing the Ford minimum of \$6 a day back to the previous high of \$7 a day in 1929.

While automobile companies may inaugurate pay increases, there is no talk so far of granting workers vacations with pay, corresponding to the recent move made by members of the steel industry. Probably the automotive industry felt that the first step was to stabilize employment and to iron out the seasonal peaks and valleys in the payroll. This has been accomplished to a marked degree this past model year, as the accompanying chart indicates. The trend is particularly noticeable when it is considered that in 1934 there was no period of even two weeks' duration when the number of those employed was stable. The curve of industrial employment in Detroit was either rising at a rapid rate or falling at a rapid rate. What the present stabilization program

INDUSTRIAL EMPLOYMENT, DETROIT
ADJUSTED FOR COMPARABLE SEASONABLE ACTIVITY



REFLECTIONS

Reflections, many times, determine Progressive steps of the future.

Reflections on Performance of equipment purchased in the past help to determine replacement or purchase of New Equipment for expansion.

Reflections on the Efficiency and Economy of Bullard Mult - Au - Matics have lead to replacements with the more Modern Mult - Au - Matics.

There's a reason. Ask Bullard Engineers for Cost Saving Data on your Jobs.

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REFLECT

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THE BULLARD COMPANY
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means is that annual wages will be appreciably increased this year.

Typical of the trend over a period of years are figures taken from an automotive parts plant, which showed annual earnings of \$1,850 a year for factory workers and an average hourly rate of 75c. in 1926. In 1933 the annual figure fell to \$915 and the hourly rate to 50c. In 1935 corresponding figures were \$1,425 and 70c. This year the figure should very closely approximate the 1926 figure, and for the large manufacturers such as the Chrysler Corp. this figure should come close to the \$2,000-a-year mark. This brings us back again to the point that the manufacturers are keeping several steps ahead of organized labor demands. One of the objectives of the United Automobile Workers, for example, is said to be the achievement of a \$2,000-a-year wage for factory workers.

Steel Price Rise

With talk of price increases in steel for the third quarter coming up at this time, it is interesting to note that some local district sales managers feel that this would be the most advantageous time to put across a price increase, as far as the customer is concerned. While it is true that the third quarter will probably show the lowest volume of business as regards automotive specifications, any price increase put through at this time would give the automotive manufacturers a chance to estimate on 1937 jobs. If a price increase were put through in the fourth quarter, costs would have already been set up on the new jobs, and resentment would follow any attempt to change the price of such a basic material as steel. Steel makers

justify the present move on the basis of increased labor costs due to the almost universal adoption of vacations with pay for workers with a service record and additional charges to the payroll account because of social security costs. Needless to say, steel makers regard automotive earnings statements rather enviously and point to their own shortcomings in this direction.

All-Steel Bodies

Among the changes that we may expect next model year are all-steel bodies in General Motors cars. In recent years more and more wood has been eliminated from the composite construction of Fisher bodies with each new model introduction, and now we have it on good authority that wood as a load-carrying member is definitely out of the picture. There may still be some fiber panel board used to back up door panels, but this means of backing up the cloth trim is common in most cars. No great change in frame construction is expected in either General Motors or other builders' cars, as the Airflow-Zephyr design of frame is as yet too expensive for large-volume sellers.

General Motors' Platform

In an address last Friday at Los Angeles, Alfred P. Sloan, Jr., attacked rather critically some New Deal policies and stated the corporation's own economic platform. He referred specifically to President Roosevelt's recent remark that reduction of costs of manufacture does not mean more purchasing power and more goods consumed, but just the opposite. Mr. Sloan urged as aggressively as possible a move for a constant lowering of

costs and prices by continued improvement of production technique. Industry should not hesitate to employ more and more mechanization, because of the stimulation that is given employment by increased ability to consume through broadening the market and bringing goods and services within the reach of a greater number.

He also stated that industry should strive for a more economic balance of national income through policies affecting the relationships of the wage scale, the hours of employment, the price level and the profits resulting from industry's productivity. In place of Government bureaucracy, he asked for acceptance of competition as the best instrumentality for regulating industry's intricate relationships; in other words, the survival of the fittest rather than protection of the inefficient—economic law as against political expediency. He saw our greatest national hope in the development of the largest possible consuming power from within.

The meeting of stockholders of the Allegheny Steel Co. and West Leechburg Steel Co., called for May 20 to act on the proposed merger of the two companies, was adjourned because of certain requirements of Pennsylvania state laws. Meetings will be held at a future date and stockholders will be advised. According to Harry E. Sheldon, president, Allegheny Steel Co., since the only delay incident to the completion of the merger is caused by the requirement of 60 days' notice to stockholders, it is expected that the plan will be consummated as heretofore arranged.



TRUCK sales are reaching new highs this year. This scene in the Dodge Truck plant, third ranking contender, calls attention to the main problem of assembling on a progressive line a wide variety of bodies—commercial express, service truck, commercial panel cars, to name those units heading the three lines shown. The planning department is the heart of such a complex scheduling system.

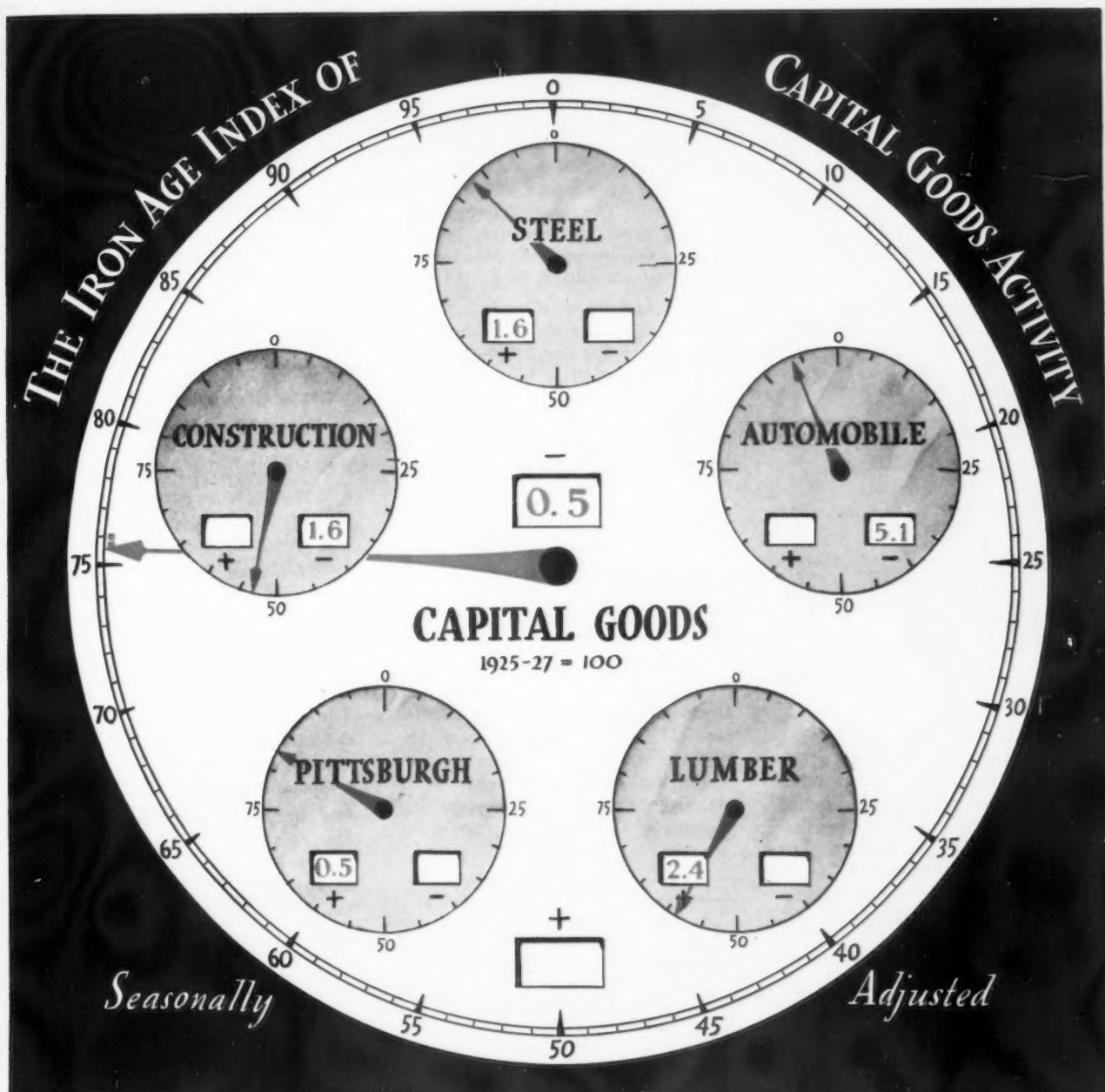
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	April, 1936	March, 1936	April, 1935	Four Months, 1935	Four Months, 1936
Raw Materials:					
Lake ore consumption (gross tons)*.....	3,485,293	2,897,867	2,360,002	9,690,650	11,967,034
Coke production (net tons) ^b	3,554,617	3,366,665	2,736,723	11,512,399	13,665,166
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	2,403,683	2,040,311	1,663,475	6,519,391	8,293,585
Pig iron output—daily (gross tons) ^c	80,125	65,816	55,449	54,328	68,542
Castings:					
Malleable castings—production (net tons) ^d.....	.....	45,378	42,035	169,620	.....
Malleable castings—orders (net tons) ^d.....	.....	47,844	37,394	163,424	.....
Steel castings—production (net tons) ^d.....	.....	51,674	31,952	122,614	.....
Steel castings—orders (net tons) ^d.....	.....	71,341	28,233	123,030	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)*.....	3,942,254	3,342,619	2,640,602	11,150,326	13,295,237
Steel ingot production—daily (gross tons)*.....	151,625	128,562	101,562	108,256	127,839
Steel ingot production—per cent of capacity*..	69.09	58.58	45.88	48.9	58.25
Finished Steel:					
Trackwork shipments (net tons)*.....	7,031	6,258	4,472	13,137	20,771
Steel rail orders (gross tons) ^e	150,057	62,300	14,000	224,592	574,348
Sheet steel sales (net tons) ^f	190,269	251,818	168,093	866,303	755,136
Sheet steel production (net tons) ^f	217,975	207,820	209,219	891,077	840,154
Fabricated shape orders (net tons) ^g.....	.....	104,868	95,380	337,852	.....
Fabricated shape shipments (net tons) ^g.....	.....	102,478	85,629	328,915	.....
Fabricated plate orders (net tons) ^g.....	.....	29,787	13,244	63,918	.....
Reinforcing bar awards (net tons) ^g	26,700	24,025	30,490	87,840	142,365
U. S. Steel Corp. shipments (tons) ^h.....	.....	783,552	591,728	2,376,976	.....
Ohio River steel shipments (net tons) ⁱ	74,110	116,510	57,825	249,922	270,162
Fabricated Products:					
Automobile production, U. S. and Canada ^k	527,726	*438,945	501,812	1,610,753	1,644,851
Construction contracts, 37 Eastern States ^l	\$234,806,300	\$198,978,300	\$124,020,000	\$421,781,500	\$780,627,600
Steel barrel shipments (number) ^d.....	.....	648,165	610,848	1,977,132	.....
Steel furniture shipments (dollars) ^d.....	.....	\$1,585,800	\$1,122,987	\$4,547,236	.....
Steel boiler orders (sq. ft.) ^d	783,961	589,676	315,562	1,638,134	2,807,388
Locomotive orders (number) ^m	15	13	2	11	88
Freight car orders (number) ^m	3,650	627	600	1,430	12,557
Machine tool index ⁿ	125.7	105.3	65.6	†60.3	114.4
Foundry equipment index ^o	134.0	115.0	113.2	†86.0	119.8
Foreign Trade:					
Total iron and steel imports (gross tons) ^p.....	.....	56,720	28,866	101,964	.....
Imports of pig iron (gross tons) ^p.....	.....	23,743	8,247	23,729	.....
Imports of all rolled steel (gross tons) ^p.....	.....	22,046	13,566	54,355	.....
Total iron and steel exports (gross tons) ^p.....	.....	264,337	205,336	1,019,648	.....
Exports of all rolled steel (gross tons) ^p.....	.....	92,606	64,625	283,833	.....
Exports of finished steel (gross tons) ^p.....	.....	86,676	54,034	247,850	.....
Exports of scrap (gross tons) ^p.....	.....	163,295	131,731	691,419	.....
British Production:					
British pig iron production (gross tons) ^r	629,800	633,600	526,300	2,084,800	2,444,000
British steel ingot production (gross tons) ^r	991,500	980,100	808,700	3,177,900	3,822,600
Non-Ferrous Metals:					
Lead production (net tons) ^s	38,073	35,150	32,389	122,119	143,646
Lead shipments (net tons) ^s	40,457	36,743	40,922	136,113	144,876
Zinc production (net tons) ^t	43,252	42,483	35,329	140,667	163,880
Zinc shipments (net tons) ^t	42,311	38,159	38,455	149,992	166,856
Deliveries of tin (gross tons) ^v	6,235	5,520	5,825	19,825	23,990

* Revised. † Three months' average.

Source of figures: * Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; ^k F. W. Dodge Corp.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodities Exchange.



Same Week Last Month	Preceding Week	Last Week
77.0	76.0	75.5
87.4	86.3	87.9
97.5	99.0	93.9
56.0	56.3	58.7
81.1	*82.2	82.3
63.0	55.4	53.8

*Revised.

COMBINED INDEX
Steel Ingot Production
Automobile Production
Lumber Shipments
Pittsburgh Industrial Production
Heavy Engineering Construction

Same Week 1935	Same Week 1934	Same Week 1933
57.0	59.5	43.0
54.1	72.6	53.7
90.4	61.6	42.2
42.5	58.2	45.4
60.1	70.4	47.7
37.4	35.2	25.5

CONTINUING its orderly descent, THE IRON AGE index of capital goods activity has again receded half a point. The latest level is 75.5 per cent of the base-period average, compared with 76.0 in the previous week, 77.0 per cent a month ago and 57.0 per cent for the corresponding week in 1935. The amount by which the index's present level exceeds its comparable position a year ago is $32\frac{1}{2}$ per cent.

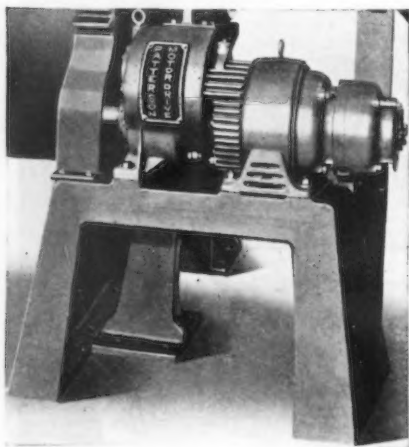
Significant occurrences among those industries embraced by the combined capital goods index's components included

the rise in steel ingot production last week at a time when this factor is usually in a seasonal decline. At length, automobile production dropped off, the recession being rather severe. Heavy engineering construction awards showed an expansion in dollar volume last week, but, as heretofore, the construction index, which is a measure of work actually in progress, eased off additionally. Lumber shipments rose encouragingly, while the Pittsburgh index, too, was slightly higher.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Cram's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

New Motor Drive For Varied Mills

A NEW motor for pebble, ball and tube mills, tumbling barrels, rotary mixers and other equipment has been brought out by the Patterson Foundry & Machine Co., East Liverpool, Ohio. This drive is of the built-in motor type with helical gears in the reducing unit. A magnetic brake is built into the



unit so that when the stop button is pushed the mill or cylinder stops instantly and by pressing the inching button the mill may be inched over into exact position for discharging and for reloading. The drive is built in sizes from 1 to 100 hp.

Armco Announces "Stabilized Steel"

FULL commercial production of "Armco Stabilized Steel" in cold-rolled sheets and strip has been announced by The American Rolling Mill Co. of Middletown, Ohio.

Stabilized steel is offered by the company as a uniform, deep-drawing and non-aging cold rolled steel with all stretcher strain permanently eliminated in the tempered condition. It retains indefinitely all of the properties of temper-rolled steel, making pre-fabrication treatments unnecessary, regardless of the length of time the metal has been in stock.

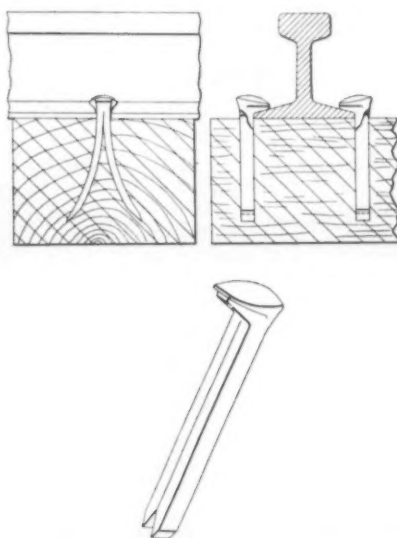
Unlike ordinary mild steels for deep-drawing purposes, the new metal has no sharp yield point in the temper rolled condition. It is superior in resistance to cracking in some very severe drawing operations, and it will retain its initial excellent drawing properties indefinitely, the company claims.

In the general run of mild steel sheets, a sharp yield point develops within a comparatively short time after cold rolling, depending upon the aging temperatures to which they are subjected. It has been found that at 212 deg. F. the yield point elongation increases continuously and reaches a maximum after about two weeks at this temperature. The same changes occur at room temperature, but require days instead of minutes for their consummation.

Manufacturers of products in which high finish deep-drawing steel sheets are used have realized that aging in their plants has aggravated breakage and stretcher-straining difficulties. Many users of drawing steel will be greatly interested in this development.

Spike Invented For Railroads

A NEW type of railroad spike, invented and patented by Louis Rasmussen, Kenosha, Wis., consists of a bifurcated stem, the sections of which spread apart when the spike is driven. It is claimed that this spike has pulling resistance of 10,200 lb., or about



four times that of the conventional spike which does not have the advantages of eight faces and stem-spreading action. This spike is made from bar stock, the chisel points being formed when the stock is cut to length. Each piece is heated to welding temperature and doubled back on itself in hairpin fashion. The loop, or closed end, is formed in a die so that the spike has a head of conventional proportions.

Introduces Hydrogen Sulphide Detector

A NEW hydrogen sulphide detector has been perfected by the Mine Safety Appliances Co., Pittsburgh, to meet a vital need for detection of hydrogen sulphide in the production of petroleum, natural gases, carbonization of coal and in iron and steel mills. According to the company, hydrogen sulphide constitutes a major hazard to life and health in many industrial fields. A concentration as low as 0.005 per cent by volume (50 parts of H_2S in a million parts of air) is harmful. The sulphide detector consists essentially of an aspirator bulb, a detector tube and a movable scale graduated to read directly in per cent of hydrogen sulphide.

The actual mechanics of operation consist merely of squeezing the bulb, thus drawing gas samples through the detector tube into the rubber bulb and forcing spent samples out the other end of the bulb. The chemical substance used in the detector tubes is a special composition selected for its sensitivity to hydrogen sulphide, its reliability and its freedom from channeling. Its accuracy is not affected by either common gases, moisture or by variations in temperature within the atmospheric range.

Reducer and Gearing Catalog Published

SPEED reducers and general gearing for elevating, conveying and power transmitting machinery are described, explained, discussed and illustrated in a 224-page catalog published by Palmer-Bee Co., Detroit, engineer, founder, machinist and steel fabricator. The types of speed reducers, right-angle or parallel shaft, which are discussed are worm, herringbone, helical and spur. Gearing, cut or cast tooth, also includes discussions of worm, herringbone, helical and spur.

The catalog is probably one of the most complete ever printed on this subject. In addition to explanations of the products, a great many tables and lists which contain prices, specifications and engineering data are included.



University of Michigan Student Wins Bridge Design Competition

CLARENCE H. ROSA, a student of the University of Michigan, won first prize in the eighth annual bridge design competition of the American Institute of Steel Construction. Second prize went to A. W. Millington, a student of Rensselaer Polytechnic Institute. Russell E. Madsen, Rensselaer Polytechnic Institute, received first honorable mention, while second and third honorable

mentions went to John A. Grove and Frank R. Streba respectively, both of Carnegie Institute of Technology.

The problem was to design a steel highway bridge, having a 300 ft. span and a 30 ft. minimum vertical clearance over a river. In addition to student certificates of award, the first prize carried a cash compensation of \$100 and the second prize of \$50.

These awards were made from the 10 best designs selected in a preliminary competition in which 88 designs by students in 18 American schools were entered. The jury of award consisted of the following: H. H. Allen, vice-president, J. E. Greiner Co., Baltimore; Arthur G. Hayden, designing engineer, Westchester County Park Commission, White Plains, N. Y.; Theodore E. Blake, architect, New York; Archibald Manning Brown, president, Architectural League of New York, New York; and H. H. Saylor, associate editor, *American Architect and Architecture*, New York.

Truscon Brings Out New Skid Platform

INCREASED strength and longer life is claimed for a new skid platform brought out by the Truscon Steel Co. at its Pressed Steel Division in Cleveland. In the old style platform the corrugations were formed clear across the platform, after which the sides were bent over to form the base or legs. This reworking of the metal where the corners were formed resulted in some crystallization at the corners.

The corrugations are not formed clear across the sheet of steel in making the new type of platforms. Instead the metal is left flat where it is bent up to form the legs so that it is deformed only once and there is practically no crystallization.

With the new method of forming a rodlike reinforcement extends along the corners. Another feature is that the integral ribs of the platform have been made deep-

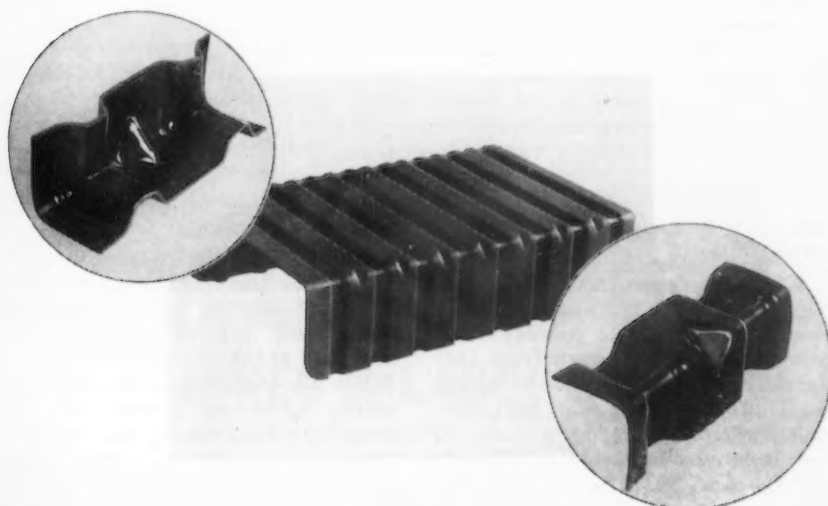
er to increase the strength and it is also stated that with the new form of construction the legs of the platform are less likely to spread out when carrying a heavy load.

United Introduces Pressuremeter

GREATER uniformity of materials produced on rolling mills is being realized through the application of a new device called a pressuremeter, which gages rolling loads, patent rights for which are controlled by United Engineering & Foundry Co., Pittsburgh.

In addition, the pressuremeter is designed to avoid overloading the mill and its consequent possible damage to equipment. By indicating and recording bearing pressures at the roll neck journals, maintenance engineers obtain accurate information as to the performance of the rolling mill.

At least 12 steel mills have already installed the pressuremeter and it is being incorporated in new mills United is now shipping. The device is applicable to any rolling equipment where the loads can be measured by housing stretch.





... Supreme Court decisions are adding little to popularity of New Deal.

° ° °

... Substitute Guffey act indicates tendency to bow to will of Court.

° ° °

... Anti-basing point legislation definitely postponed at this session of Congress.

° ° °

... Manufacturers' association estimates that 30-hr. week would cost industry \$1,000,000,000 yearly.

° ° °
By L. W. MOFFETT

Resident Washington Editor,
The Iron Age

° ° °

WASHINGTON, May 26.—The devastating defeats the New Deal has met at the hands of the Supreme Court have failed utterly to develop the reaction that the Administration had hoped for and indeed had sought to encourage. . . . This is evident from the country-wide sentiment that arose from the each succeeding decision knocking out laws that were to be fitted into the scheme of "planned economy" and reform to regulate the industrial and social structures of the nation. . . . Proof of this is seen by following the rapid march of events. . . .

Under the stress of deep depression the National Industrial Recovery Act was passed. . . . While there was no idea of the scope it would attain or seek by way of regimentation, industry joined in on a widespread scale, as was nec-

essary, in having the law enacted and cooperated freely and even fervently in its cumbersome operation. . . . Finally when the Supreme Court in its unanimous and smashing decision held that the act was unconstitutional it was found that the Blue Eagle was not the popular bird that its ardent keepers thought it was. . . .

The decision did bring a considerable surge of resentment toward the Supreme Court but it fell far short of the volume that had been expected. The rejoicing was vastly greater than the sorrow. . . . And when the Presidential comment on the "horse and buggy" decision went to the country, the response was the opposite of that which had been expected. . . . Much of the resentment toward the Supreme Court switched completely about and turned toward praise of the court. . . .

When the court knocked out the Agricultural Adjustment Act the resentment from the country was comparatively mild, even from the agricultural sections. . . . and when the Guffey coal act was held unconstitutional there were only a few isolated and feeble attacks of the court. . . . It is recalled, of

course, that Secretary of Agriculture Henry Wallace, unable to control himself because of the invalidation of the processing taxes, broke forth and referred to the AAA decision as "legalized theft," but aside from this tantrum, expressions of disappointment chiefly marked the comment of those who wanted to see the AAA and Guffey law stand. . . . Significantly enough, there was no Administration criticism of the Guffey coal act decision. . . . This decision virtually had been invited inasmuch as the Administration, egged on by the United Mine Workers, apparently questioned its legality when the President urged its passage by Congress.

The impression should not be gathered that the Administration has tamely submitted to the Supreme Court decisions. . . . Far from it. . . . It is indeed sorely irritated at the Court, as denoted by the tone of comment on the decisions, moderated and suppressed though the tone is. . . . Its attitude of feeling against the court is more concretely expressed by efforts to circumvent decisions. . . . The outstanding example is the forcing through Congress of the so-called Soil Conservation Act, jammed to passage as a substitute for AAA. . . . It is clearly a subterfuge, accomplishing under the false claim of conservation what was knocked out as unconstitutional in the AAA decision. . . . And it may be added that there is clearly growing resentment toward the Administration for its scarcely concealed contempt for court decisions, together with moves made to circumvent them. . . .

The quick move to rush a substitute for the Guffey act through at the present session of Congress is in itself inspired partly by resentment at the court decision. . . . While the Administration has not openly advocated passage of the substitute it obviously has Administration approval. . . . Yet, aside from the feeling of many coal oper-

REDUCE FORGING AND MACHINING COSTS . . . WITH **JALCASE**

The unusual combination of excellent forging, machining and carburizing qualities of Jalcas offers the opportunity to attain minimum costs and maximum production. Jalcas is plastic, it flows well under the forge, and has a high order of machinability. Consider these performance characteristics in connection with the forged parts illustrated. They are made of low carbon Jalcas (S.A.E. X1315). The gas engine crankshaft shown at the left is perfectly formed, with minimum wear on the forging dies. Subsequent operations result in a finished part of first quality because Jalcas has machinability approaching that of Bessemer screw stock, and in case carburizing, extraordinarily rapid penetration of carbon occurs. Note the deep sunk hole in the bushing forging shown below. Here the plastic nature of Jalcas shows to advantage.

Jalcas is supplied in both hot rolled and cold finished and in the various carbon grades. A special bulletin, descriptive and technical, will be sent on request.

OTHER J & L PRODUCTS

FOR MANUFACTURING: Bars, Shapes, Plates—Forging Steel—Bessemer Screw Steel—Shafting—Tubing—Cold Heading Wire—Spring Wire—Tin Plate and Black Sheets, Tin Mill Sizes.

FOR CONSTRUCTION AND MAINTENANCE: Fabricated Structural Work—Seamless and Welded Pipe—Concrete Reinforcing Bars—Structural Shapes, including Junior Beams and Lightweight Channels.

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STEEL**



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AMERICAN IRON AND STEEL WORKS

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Sales Offices: Atlanta Boston Buffalo Chicago Cincinnati Cleveland Dallas Denver Detroit Erie Houston Los Angeles
Memphis Milwaukee Minneapolis New Orleans New York Philadelphia Pittsburgh Seattle St. Louis San Francisco Tulsa
Warehouses: CHICAGO CINCINNATI DETROIT MEMPHIS NEW ORLEANS* NEW YORK (Long Island City)* PITTSBURGH

* Operated by National Bridge Works Division of Jones & Laughlin Steel Service, Inc.

Canadian Representatives: JONES & LAUGHLIN STEEL PRODUCTS COMPANY, Pittsburgh, Pa., U. S. A., and Toronto, Ont., Canada

ators and the United Mine Workers toward the Supreme Court, it is to be said to their credit that they apparently think, and perhaps with good reason, that the substitute meets the constitutional requirements by omitting the labor provisions but otherwise incorporating, with certain modifications, other features of the Guffey act. . . .

The bill was introduced by Senator Guffey of Pennsylvania and Representative Vinson of Kentucky and carries practically the same price-fixing and marketing provisions as the invalidated law. . . . These provisions fell under the majority decision not because of their unconstitutionality within themselves but because the majority held that being integral parts of the entire law, they would have to fall with the law. . . . On the other hand the other four justices, including Chief Justice Hughes, held that the marketing and provision fixing provisions were valid and the Chief Justice specifically insisted that the various provisions were separable. . . .

Good law or bad law from the point of regulating the coal industry, the new approach, evidently intended to meet the objections as to its constitutionality, is both sensible and gratifying. . . . It shines by comparison with the sulking attitude, the attitude of contempt and circumvention; the determination to be the maker and administrator of pet laws, regardless of their constitutionality. . . .

What but the gravest conse-

quences could follow consistent disregard of laws by those responsible for their administration? . . . Inevitably, sooner or later, it would set a precedent for the country as a whole, with the result that it would respect those laws it preferred to respect, and disregard those it did not like. . . . This would be the essence of revolution. . . .

For those who want the power of the Supreme Court curbed, the remedy is to seek amendment to the Constitution in an orderly manner. . . . And if they want to make a campaign issue of the question the moment is at hand. . . . It is strongly suspected that the majority of the American public desire no such amendment but that if they do want the Court's power curbed they want it done in a proper way. . . . The Supreme Court evidently is more highly regarded by the public generally than any other branch of the Government. . . . If the country is to enter upon industrial and social regimentation, it ought to insist upon having the privilege of approving the goosetep. . . . It should not yield to a dictatorship that would break away from the American system. . . . Numerous members of Congress have said that in their candidacy for reelection they will advocate legislation to curb the power of the Supreme Court. . . . If they do the outcome will be watched with great interest. . . .

Sniff as the New Deal will at contentions that such a departure

is contemplated, the fact remains that the belief is finding increasing strength by reason of both past moves and moves that are indicated. . . . The thought is widening that if reelected the New Deal will take the vote as a "mandate" to proceed further toward Federal control of industry and increased projection into social and economic reform. . . .

The recently rejected House tax bill is a late example of this sort of experimentation, far afield from the economic system on which the country was built. . . . Another is the implied threat of Federal control of industry if it does not re-employ many of the unemployed, a large portion of which have been thrown out of employment by unsound programs, notably the agricultural program of scarcity. . . . Many others could be cited. . . . Taken together they have forced the conclusion in thoughtful minds that the most important issue in the pending campaign centers upon the retention of the American system or adoption of a system of economic regimentation and consequently an ever-growing Federal bureaucracy. . . .

Anti-Basing Point Legislation Definitely Postponed

Any lingering belief that anti-basing point legislation would be attempted at the present session of Congress has been dispelled. It was removed when the House Committee on Judiciary passed a resolution last Thursday requesting the chairman of the committee to introduce an amendment striking the anti-basing point provision from the Patman price discrimination bill, taken up in the House.

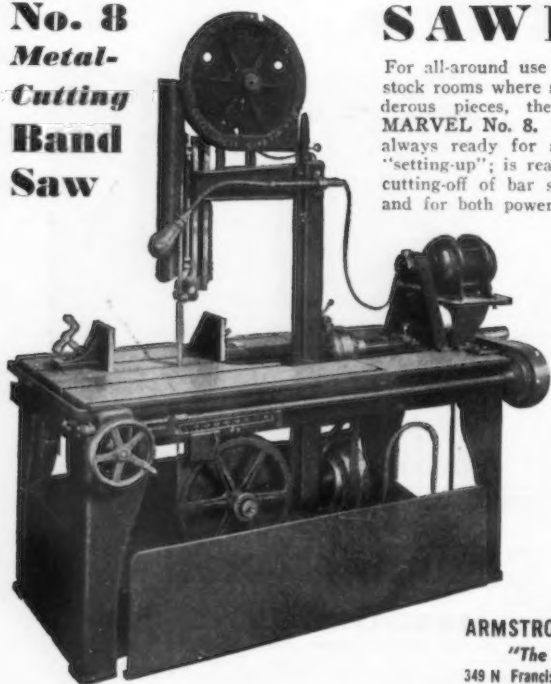
The action of the Judiciary Committee was approved by Representative Patman, sponsor of the price discrimination bill. The Senate price discrimination bill, sponsored by Senator Robinson of Arkansas, recently was passed and did not contain the anti-basing point provision. Therefore it will not be an issue in conference between Senate and House members and it cannot be reinserted by the conferees.

So strong was the opposition to the anti-basing point provision in the Patman bill that supporters of the bill agreed upon deletion of the provision for fear that its retention would make defeat of the bill certain. The anti-basing provision was inserted in the bill by Representative Utterback of Iowa. Mr. Utterback and Senator Wheeler of Montana are authors of the Wheeler-Utterback anti-basing point bill on which exten-

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No. 8

Metal-Cutting Band Saw



for "Run of the Shop" SAWING

For all-around use and variety of cuts . . . for shops and stock rooms where small, delicate work is apt to follow ponderous pieces, there is no saw built that equals a MARVEL No. 8. This flexible, universal machine tool is always ready for any job without adjustment or special "setting-up"; is ready for large work, small work, straight cutting-off of bar stock, notching, angular or mitre work, and for both power and hand feed jobs.

Its expansive, T-slotted bed eliminates the need for most fixtures and jogs—work is set up with standard tools as on a planer or shaper and the blade fed through the work, assuring a straight, accurate cut always. Frequently more than one cut can be made without shifting the work on the bed and setting up time is cut to a fraction. Handling all work from $\frac{1}{8}$ " x $\frac{1}{8}$ " to 18" x 18" the MARVEL No. 8 is the logical first saw for any warehouse, tool room or die shop.

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ARMSTRONG-BLUM MFG. CO.
"The Hack-Saw People"
349 N. Francisco Ave. Chicago, U.S.A.



sive hearings were held before the Senate Committee on Interstate Commerce, of which Senator Wheeler is chairman.

The Senator recently announced that no further hearings on the bill have been arranged. No effort will be made to report it from the Senate committee. Even in the doubtful circumstance that the bill could be favorably reported it is obvious it could not be enacted into law—again in the doubtful event that it has sufficient support in Congress—before adjournment, which Congress is frantically trying to take by June 6, evidently at the desire of President Roosevelt.

Tin Plate Makers Deny Federal Trade Commission Charges

In separate answers filed with the Federal Trade Commission, 15 tin plate manufacturers have denied the commission's charges that they entered into an agreement under which they refused to sell stock plate to jobbers of tin plate and small manufacturers of tin cans and other metal containers. The respondents embrace virtually the entire tin plate making capacity of the country.

The complaint alleges violation of Sec. 5 of the Federal Trade Commission Act. The commission charged that the alleged practices tend to create a monopoly in the American Can Co. and the Continental Can Co., principal purchasers of stock plate because of their size and purchasing power, and because of alleged deprivation of small competitors of their supply of tin plate.

It is charged that small companies who in the past could purchase stock plate through jobbers are forced to buy production plate at substantially higher prices than the two large can companies. Without exception, each tin plate maker denied the allegations.

The hearing date has not been fixed but likely will be about June 10.

Seeks Information on Tin Plate Scrap

Secretary of State Cordell Hull, as chairman of the National Munitions Control Board, has addressed letters to producers of tin plate scrap requiring information regarding their output and sale of the material, with particular relation to exports. The information is sought in connection with the so-called tin plate scrap embargo act under which shipments may be exported only through licenses issued by the Munitions Control Board. Request is made that the informa-

tion reach the State Department not later than June 1.

Purchasers of tin plate scrap also are asked to inform the board of the names of producers from whom they buy material. The questionnaire accompanying the letter asks for the number of plants where tin plate scrap is produced, their location, the amount produced and the average net price received for scrap sold in the United States in 1935; average net

price for domestic sales between Jan. 1 and April 15, 1936; estimate of production in 1936; amount exported and average net price received in 1935; amount exported between Jan. 1 and April 15, 1936; amount sold during 1935 or 1936 to third parties for export and to whom sales were made and their amounts; present contracts or other definite obligations to export or to sell for export; copies of contracts or obligations; plans, if

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"A.W." QUALITY PRODUCTS

Blue Annealed Sheets & Strip
Sheared Steel Plates
Billets, Blooms & Slabs

"A.W." "70-90" Super Strength Steel

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Rolled Steel Floor Plate

Primarily it is the integrity of "A.W." Products which is to be credited with Alan Wood success. But "A.W." Service, with its more personal attention to detail, has contributed to that success in no small degree.

"A.W." Service includes immediate deliveries from ample standard stocks maintained by distributors and warehouses in principal cities, as well as prompt execution of special mill orders.

And the competent services of our Metallurgical and Engineering Departments are freely offered in applying "A.W." products to the more efficient and economical solution of your problems.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

BRANCHES:

Philadelphia, New York, Boston, Los Angeles, San Francisco, Seattle, Houston

110 YEARS' IRON- AND STEEL-MAKING EXPERIENCE



any, for exporting, in the event license can be secured.

Manufacturers Oppose 30-hr. Week

Declaring that compulsory work spreading is "the wrong way to do the right thing," the National Association of Manufacturers, in a labor relations bulletin, estimated that the proposed 30-hr. week would result in an annual net deficit to industry of \$986,831,044.

In an official statement published in the bulletin, the N.A.M. directors listed 12 reasons for believing that such a plan would defeat its own ends by causing decreased rather than increased employment.

"Business could not continue to pile up deficits approximating \$1,000,000,000 a year," said the statement. "Consequently, the selling price of manufactured products would have to be increased. Under this condition, the real wages of workers would remain constant and the increased cost of goods would reduce demand, curtail production and result in decreased rather than increased employment."

C. I. O. Make Capital of Portsmouth, Ohio, Steel Strike

Chairman John L. Lewis of the Committee for Industrial Organization, eager to unionize the steel industry, has written President Michael F. Tighe of the Amalgamated Association of Iron, Steel and Tin Workers accepting the terms of the latter's resolution adopted at the Canonsburg, Pa., convention which favored industrial unionization but insisted upon retention by the Amalgamated of jurisdiction. Mr. Lewis urged that the drive for unionization of the industry be started at once and assured the Amalgamated that he would raise \$500,000 to push the campaign.

Meanwhile it is a matter of interest here as to what activity, if any, the C. I. O. may seek to project into the strike of Amalgamated workers at the Portsmouth, Ohio, plant of the Wheeling Steel Corp. In some quarters it is the belief that the C. I. O. might seek to take advantage of this strike as an entering wedge toward unionization of the steel industry. Secretary of Labor Perkins has sent R. M. Pilkington, conciliator, to Portsmouth in an effort to settle the dispute.

The C. I. O. is meeting with growing resistance at the hands of craft unions within the American Federation of Labor. Bitterly hos-

tile to the industrialists from the outset, Arthur Wharton, president of the International Machinists' Union, has urged the executive council of the American Federation of Labor to suspend the nine unions represented by the C. I. O. But the insurgents, as the C. I. O. representatives are called, say that the council has no power to oust them. They say they could be suspended only by a two-thirds vote of the A. F. of L. And industrial unionists say that they control more than one-third of the A. F. of L. membership and are gaining strength rapidly.

Supreme Court Upholds Steel Corporation In Elgin Joliet & Eastern Case

The United States Supreme Court yesterday held against the Government in its effort to restrain the Elgin, Joliet & Eastern railroad, United States Steel Corp., subsidiary, from transporting products of steel companies owned by the Steel corporation. The Government had charged in a suit filed in 1930 that such transportation was in violation of the commodities clause of the Interstate Commerce Act. This clause prohibits a railroad from carrying products, other than timber and its manufactured products, owned by a railroad or in which a railroad has any interest, except commodities intended for use in the conduct of its business as a common carrier.

The Government suit for any injunction, filed in the Northern District Court of Illinois, was a new test case of the commodities clause. In its ordinary application the commodities clause was held to prohibit a railroad from carrying the products of a mine or plant owned by it. The Elgin, Joliet & Eastern does not own any mine or plant, but is owned, like its producing subsidiaries, by the United States Steel Corp.

The lower court dismissed the suit and appeal was taken by the Government to the Supreme Court. Arguments were made about one month ago.

The majority opinion of the Supreme Court was read by Mr. Justice McReynolds, joined in by Chief Justice Hughes and four associate justices. A dissenting opinion was rendered by Mr. Justice Harlan F. Stone, joined in by Justices Brandeis and Cardozo.

The Supreme Court upheld the lower court which said that mere ownership by the United States Steel Corp. of all shares of both the railroad company and a producing subsidiary was not enough to show that products made or

owned by the latter were articles or commodities produced by the former. Subsidiaries whose products the Elgin, Joliet & Eastern carries are the Carnegie-Illinois Steel Corp., the American Bridge Co., the American Sheet & Tin Plate Co., the National Tube Co., the American Steel & Wire Co., and the Cyclone Fence Co.

The lower court said that the evidence failed to show that the railroad has any interest, direct or indirect, legal or equitable, in the commodities which it transports for subsidiaries of the Steel corporation. The case was dismissed by the lower court for want of equity.

The Supreme Court pointed out that it was insisted that, although a railroad company may own the shares of a producing company and yet transport the latter's products without violating the commodities clause, if a holding company acquires the shares of both carrier and producer, then such transportation becomes illegal. The theory, it was stated, is that subsidiaries of holding companies are necessarily no more than parts of it. Evidently, the majority opinion declared, this is entirely out of harmony with the reasoning advanced to support construction of the act adopted in the case of the United States vs. Delaware & Hudson Co., and in direct conflict with language which was quoted from the case of the United States against D. L. & W. Railroad Co.

"Considering former rulings, it is impossible for us now to declare as a matter of law that every company all of whose shares are owned by a holding company necessarily becomes an agent, instrumentality, or department of the latter," said the majority opinion.

The Supreme Court pointed out that the Elgin, Joliet & Eastern has been under constant supervision by the Interstate Commerce Commission. It said the railroad functions as a separate corporate carrier under immediate control of its own directors, no one of whom is on the board of the holding company; it owns all necessary equipment, makes its own contracts, manages its own finances, serves its patrons without discrimination "and apparently to their satisfaction."

Pointing to the decision of the Supreme Court in the government dissolution suit against the Steel corporation, which held the latter was not violating the anti-trust act, the Supreme Court said that the present proceeding is one to prevent probable future unlawful conduct and not to punish acts long since completed, "however reprehensible."

BASOLIT *Protected* PICKLING TANKS



THE above picture shows a double line of continuous strip pickling tanks recently installed in one of the largest steel mills in the country.

The tanks designed by The B. F. Goodrich Co. are of rubber lined steel. As a protection for the rubber lining our well known construction of a double sheathing

of acid-brick and BASOLIT was used.

Including the tanks, all acid floors and sewers were brick-lined with BASOLIT joints.

The installation illustrated is one of many hundreds where BASOLIT has contributed toward long life and efficient operation of modern pickling equipment.

NUKEM PRODUCTS CORP., Buffalo, N. Y.

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PITTSBURGH

DETROIT

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PERSONALS

J. G. CARRUTHERS, who has been special representative for the Bethlehem Steel Co. since August of last year, has been appointed assistant general manager of Western sales, assisting W. B. TOPPING, general manager of Western sales. Mr. Carruthers first entered the steel industry as assistant manager of sales for the Cambria Steel Co. at Cincinnati. Later he served as assistant manager, then manager of sales at Cincinnati for the Carnegie Steel Co., Illinois Steel Co. and the Tennessee Coal, Iron & Railroad Co. In 1922 he became associated with the Otis Steel Co., of which he later became vice-president.

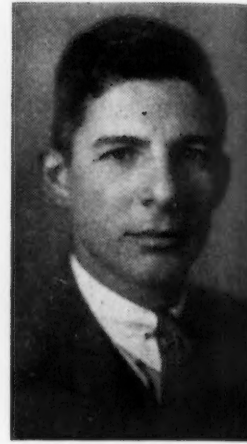
RALPH W. KEMPSMITH, who has been appointed Cleveland district manager of sales, was graduated from Lehigh University in 1911 with the degree of mechanical engineer, and joined the sales organization of the Bethlehem company in 1913 in its Pittsburgh sales office, where he remained for two years. Then he spent one year in the New York sales office and two years in the bar sales department at Bethlehem. He served in the Army for two years during the War and in 1920 returned to the



J. G. CARRUTHERS



R. W. KEMPSMITH



F. M. HUFFMAN

Bethlehem organization and was assigned to the Cleveland sales office where he has since remained. He was made assistant manager of sales in Cleveland in 1935. He is a member of the Union, University and Country Clubs of Cleveland and the Cleveland Chamber of Commerce.

JOHN C. CHANDLER, who has been Cleveland district sales manager of Bethlehem since 1922 when that company took over the Lackawanna Steel Co., has been assigned to special duties. He had been Cleveland district manager of the Lackawanna company for a number of years and previously had

been connected with the pig iron sales department of Pickands, Mather & Co., Cleveland.

F. M. HUFFMAN, new sales manager for Bethlehem at St. Louis, was graduated from Lehigh University in 1922 in metallurgical engineering and started immediately with the Bethlehem company as special apprentice. In 1923 he was assigned to the Philadelphia sales office and was transferred to Chicago two years later, where he has remained to the present time.

♦ ♦ ♦

F. J. KOEGLER has been elected president of the Doehler Die Casting Co., Toledo. H. H. DOEHLER, former president, has been appointed chairman of the board and will make his headquarters in New York, although the main office of the company will remain in Toledo. Mr. Doehler's time will be divided between Toledo and the three Eastern plants of the company, and he will continue to formulate general policies, although the details of management have been delegated to the new president.

♦ ♦ ♦

C. R. McDONALD has been elected vice-president of the International Harvester Co., succeeding ALBERT A. JONES, vice-president in charge of manufacturing, who has retired because of ill health. Mr. McDonald, who has been manager of manufacturing since 1929, has had 41 years of service with the company.

♦ ♦ ♦

HARRY S. PECK has joined the sales staff of the Baker Industrial Truck Co. at 407 South Dearborn Street, Chicago. Mr. Peck will be associated with BLAKE HOOPER who has been district representative for Baker for the past several years.

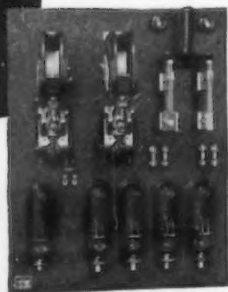


Views of Front-enclosed Style with Externally-operated Knife Switch and of Open Style Protective Panels.

NEW DESIGN PROTECTIVE PANELS for CRANES

These are compact units for protecting the electrical equipment used on overhead, locomotive and similar cranes. They take the place of Knife Switches, Circuit Breakers, Fuses, etc., otherwise necessary and combine all the protective devices into one unit easily installed in the crane cab.

Important Safety Features include emergency stopping of all motors, low voltage protection, provision for padlocking main line Knife Switch open and other outstanding advantages. New Bulletin 1021-A gives complete information on open, front-enclosed and completely-enclosed styles for use on cranes having from 2 to 8 motors. Write for your copy today.



 **The ELECTRIC CONTROLLER
and MFG. CO., CLEVELAND, OHIO** 
**AUTOMATIC CONTROL for CRANES • MILL DRIVES and MACHINERY
BRAKES • LIMIT STOPS and LIFTING MAGNETS.**

DR. JOSEPH BECKER, president, Koppers Construction Co., has been awarded the Watson Clark Medal by the Franklin Institute of Philadelphia in recognition of his marked achievements in the gas industry, particularly in the adaptations of the use of producer gas and blast furnace gas for heating Becker by-product coke ovens. The medal is awarded annually to the author of the most notable advance in knowledge or improvement in the science of gas manufacture, distribution or utilization.

♦ ♦ ♦

FRANK BURGAN, assistant manager of the small tool division of the Ingersoll Milling Machine Co., Rockford, Ill., has been placed in charge of the sale of cutters in Indiana and Ohio.

♦ ♦ ♦

W. R. RAMSAUR has been appointed chief engineer of the Young Radiator Co., Racine, Wis. He received his technical training at Massachusetts Institute of Technology and has been engaged in radiator manufacturing for the past seven years.

♦ ♦ ♦

FRANK B. POWERS, heretofore in charge of design of d.c. traction motors for the Westinghouse Electric & Mfg. Co., has been appointed manager of the railway engineering department to succeed the late Claude Bethel. He is a graduate of the University of Illinois.

♦ ♦ ♦

HANS E. MELIN has joined the sales staff of the Wean Engineering Co., Warren, Ohio. He is a graduate of Chalmers Technical University, Gothenburg, Sweden, and recently returned from London, where he was identified with the Wellman Smith Owen Engineering Corp. Prior to that he was connected with the Aetna-Standard Engineering Co., Youngstown.

♦ ♦ ♦

GEORGE O. O'HARA has joined the sales department of the Detroit Electric Furnace Co. Since 1930 he has been with the electrode division of Republic Carbon Co. and its successor, National Carbon Co. Before that he was with Oil Well Supply Co. and Standard Steel Works Co. He came to the United States in 1922 from Australia, where he had been connected with the Broken Hill Proprietary Co.

♦ ♦ ♦

CARL LAGER, for the past 46 years chief engineer of the Morris Machine Works, Baldwinsville, N. Y., has been elected president

of the company, succeeding the late Windsor Morris. PIERCE J. McAULIFFE, who has been identified with the company since 1910, in recent years as representative in the New York office, has been elected vice-president and general manager.

♦ ♦ ♦

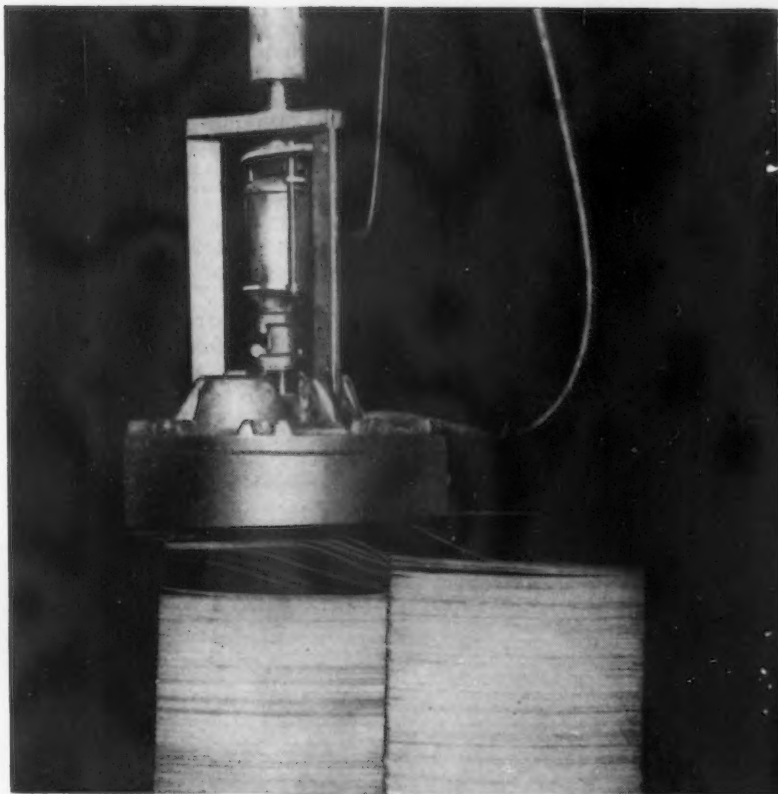
CHARLES L. BERGER, who has been identified with the malleable iron industry for the past 48 years, has resigned as chairman of the board of the Eastern Malleable

Iron Co., Naugatuck, Conn. He started with Tuttle & Whittemore Co., a predecessor company, in 1888 as a stenographer and worked his way up. He was made treasurer in 1897, later vice-president of the Eastern Malleable Iron Co. and president in 1924, serving in that capacity until 1935 when he was made chairman of the board.

♦ ♦ ♦

A. D. HEATH, 1701 North Illinois St., Indianapolis, Ind., has

MAGNETIC SHEET SEPARATION



The face of the magnet is concave. A 25 cycle heavy electric hammer is adjustably suspended over the magnet with the rounded plunger protruding thru the middle of the magnet.

1st Operation—Set the magnet on the pile of sticking annealed sheets and operate the electric hammer.

2nd Operation—Raise the hammer and magnet clear of the pile and energize the magnet repeatedly.

Several succeeding operations—Raise the magnet and hammer to clear the pile of sheets by 1½" and rattle magnetically, then to 2" and 2½" and 3" if necessary, and rattle magnetically until practically complete separation is effected.

Operation is quite rapid and about 3" of sheets are separated for each cycle.

About two-thirds as many of the same kind of men are required by this method of separation as are required for the purely hand labor method of separation.

We will sell on trial.

THE OHIO ELECTRIC MFG. CO.

5908 MAURICE AVENUE, CLEVELAND, OHIO

been appointed exclusive representative in the Southern Indiana territory for the Ex-Cell-O Aircraft & Tool Corp., Detroit. Mr. Heath will handle all of the company's products in this territory, including those of the Continental and Machinery Divisions.

♦ ♦ ♦

FORREST H. RAMAGE, heretofore assistant manager of the advertising and sales promotion division of Republic Steel Corp., Cleveland, has been promoted to sales promotion manager in charge of sales promotion activities. His work will be in connection with the new product development division, headed by JULIUS KAHN. Mr. Ramage was graduated from Michigan College of Mining and Technology and became identified with the Republic organization in 1926 as a sheet mill metallurgist. The following year he was assigned to the New York sales office and in 1929 he was transferred back to Youngstown on development work on Toncan pipe. He was appointed to the post he held before present promotion in 1931. CHESTER W. RUTH, formerly assistant manager of the advertising and sales promotion division, has been named assistant director of advertising. He joined the advertising department of United Alloy Steel Co. in 1926 and remained with the company through the various mergers. He was made assistant advertising manager of the Republic Steel Corp. in 1930.



F. H. RAMAGE



C. W. RUTH



M. W. SMITH

WILLIAM W. KNIGHT, JR., heretofore sales engineer in the New England territory for the Timken Roller Bearing Co., Canton, Ohio, has been made sales engineer in the Pittsburgh district by the Morgan Construction Co., Worcester. H. H. Wood will remain in charge of the company's Pittsburgh office, which will soon be moved to 2028 Koppers Building.

♦ ♦ ♦

M. W. SMITH, who has been associated with the Westinghouse Electric & Mfg. Co. since 1915, has been appointed manager of engineering. He joined the com-

pany as student engineer and has since been continuously identified with generator engineering operations, first as design engineer, later as section engineer and more recently in charge of the design of the large rotating alternating current machinery of the generator division.

♦ ♦ ♦

ELIAS C. ATKINS, who has been identified with E. C. Atkins & Co., Indianapolis, Ind., for the past 17 years, has been elected first vice-president of the company. He has been superintendent since 1931. K. W. ATKINS, who has been active in the sales division since 1922, has been made vice-president and general manager, succeeding the late Nelson A. Gladding. H. C. ATKINS, JR., who was production manager, is the new superintendent, the position formerly held by E. C. Atkins.

♦ ♦ ♦

J. R. STONE has been made president of the newly-organized Machinery & Tool Sales, Inc., 401 New Center Building, Detroit. L. J. JURZEK is secretary-treasurer.

♦ ♦ ♦

A. C. COOK has been made New York district representative for the Hannifin Mfg. Co., Chicago, and Athol Machine & Foundry Co., Athol, Mass. He will have headquarters with Wilson-Brown, Inc., 30 Church Street, New York.

♦ ♦ ♦

C. M. TATE has resigned his position with the Askania Regulator Co. to join the Hagan Corp., Pittsburgh, and will specialize in the application of combustion control to metallurgical furnaces in the steel mill industry.



An Important Announcement *For Users of* **WIDIA TOOLS**

Importation of Widia Cemented Carbide Cutting Tool Material Discontinued

ON MAY 15, 1936 the Fried Krupp Works of Essen, Germany, manufacturers of Widia cemented carbide cutting tool material, ceased importation of this material into the United States.

Thomas Prosser & Son, 15 Gold Street, New York City, United States distributors of this material for the Fried Krupp Works, therefore, on that date discontinued the sale of Widia cemented carbide cutting tool materials.

In order to continue service to users of Widia tools, Carboloy Company, Inc., took over, on May 16, 1936, the Widia cemented carbide tool business of Thomas Prosser & Son, including the entire inventory of Widia material, and the greater part of the Prosser field organization handling Widia tool sales and service.

In connection with this change we wish to announce that we are in a position to handle all former Prosser accounts under the same prices, terms and conditions of sale as existed under Thomas Prosser & Son. We are also able to furnish all current grades of Widia until the former Prosser inventory, which we have acquired, is exhausted. Based on our observation of, and experience with, the performance of Widia grades, it is our sincere belief that, when our inventory of Widia material is exhausted, we will be able to furnish Carboloy grades which will satisfactorily meet all requirements of former Widia tool users. Naturally, we will be pleased to supply Carboloy cemented carbides to former Widia users immediately if desired.

All former Widia users will be given the same attention in the future as in the past, and by the same field men supplemented by our own staff.

CARBOLOY COMPANY, INC.
2995 East Jefferson Ave., Detroit, Mich.

SALES AND SERVICE OFFICES

CHICAGO • CLEVELAND • DETROIT • PITTSBURGH • PHILADELPHIA • NEWARK
PACIFIC COAST REPRESENTATIVES: LOS ANGELES, CALIFORNIA • PORTLAND, OREGON

[At the request of Thomas Prosser & Son we wish to state that they have discontinued the sale of Widia material only. Thomas Prosser & Son still continue their business of fine steels, mechanical specialties, chilled iron rolls, hardened steel rolls and machinery of various kinds.]

Ford Opens New Control Laboratory

A NEW chemical and metallurgical testing and production control laboratory which is one of the most modern industrial laboratories in the United States has been placed in service by the Ford Motor Co. at the Rouge plant at Dearborn, Mich. The laboratory is another unit of the company's \$37,000,000 expansion and modernization program.

Completely air-conditioned and furnished with new X-ray, physical testing and chemical analysis equipment, the laboratory is now working on a 24-hour day basis. It is used to analyze the molecular structure of steels, to determine the physical properties of metals and fabricated parts, and to analyze steels, irons and other metals; textiles, paints, oils, and rubbers used in the factory.

Included in the equipment is a new X-ray machine having an oil-cooled fine focus radiographic tube of 230,000-volt capacity. It has sufficient intensity to penetrate 4 in. of steel, and through its use flaws less than 2 per cent of total thickness are detected. Its intensity

permits a great time saving in making X-ray photographs. A crankshaft, for example, can be photographed in about 3 min. The X-ray department also includes a diffraction machine equipped with a new tube which will obtain in 20 minutes pictures which formerly required from 24 to 70 hours of exposure. The machines are used largely in research to improve casting and steel treating technique through a study of the atomic structure of the finished steels and alloys.

Another new instrument in the laboratories is the profilograph, designed at the University of Michigan. The instrument in the Ford laboratory is the third one of its kind to be constructed. It is used to examine steel finishes. Through an optical magnifying system, any imperfections in the finish are detected by a diamond point and magnified 2000 times vertically and 64 times horizontally. Thus the graph of a surface of a $\frac{1}{8}$ in. specimen of steel becomes a readable chart 8 in. long, with minute irregularities showing as deep ridges.

Well-equipped developing and printing rooms adjoin the X-ray and metallographic rooms. In these rooms also are miniature molding

presses used to mount the metal specimen in Bakelite for easy handling.

In the physical testing rooms, two new hydraulic machines have been added to the equipment used in the old quarters. One of the machines is a 100,000 lb. machine, and the other a light-weight machine permitting greater accuracy in testing light parts, such as fabricated gears.

In the analytical laboratory, all work tables are of stainless nickel-chrome-steel, and furnaces and other apparatus are of the latest improved type. At the end of the room is a specially constructed salt spray cell, where plated parts are subjected to salt baths. The laboratory throughout is lighted by an improved "daylight" system with batteries of five special bulbs providing a light as nearly equivalent to daylight as illumination engineers have been able to devise.

The laboratory is manned by a staff of 65 technicians, working in shifts. Since an analysis is made of every cast of metal from the blast furnaces, some part of the staff is on duty 24 hours a day, keeping an accurate check on the materials used in the factory.

for heat and corrosion resistance - AMSCO - Alloy

No matter what the part or the process—if your equipment requires cast parts that must withstand the ravages of high operating temperatures—or the corrosive action of acids, gases, salt water, etc.—use AMSCO-Alloy.

AMSCO-Alloy is made in an adequate series of analyses—one of which is just suited to your op-

erating conditions. Use it for furnace, oven, boiler and stoker parts, valves, fittings, flanges, boxes, racks, pin bars, bucks, stools, and all other process equipment parts requiring maximum heat and corrosion resistance!

Specify AMSCO-Alloy! Send your blue prints for quotation.

AMERICAN MANGANESE STEEL COMPANY

Division of American Brake Shoe & Foundry Company

375 East 14th Street, Chicago Heights, Ill.

Foundries at Chicago Heights, Ill.
Oakland, Calif.

New Castle, Del.

Denver, Colo.

Offices in Principal Cities



Program for Social Progress in America

THE elements of an American program for social progress will be the single general theme to be discussed at the twentieth annual meeting of the National Industrial Conference Board to be held May 28, at the Waldorf-Astoria, New York.

A distinguished national leader in each of five primary fields which represent the major elements of such an American program will discuss how his particular field can contribute most soundly to future social advancement in this country. The essential elements of an American program for social progress and the speakers who will discuss them at the conference board's annual meeting are:

Education: Dr. Harry Woodburn Chase, Chancellor, New York University; science: Dr. Karl T. Compton, president, Massachusetts Institute of Technology; religion: Bishop Francis J. McConnell, D.D., LL.D., of the Methodist Episcopal Church; government: Charles Nagel, former Secretary of Commerce and Labor, and business: Ralph T. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., and past president of the American Society of Mechanical Engineers.

British Steel Output Continues to Rise

RISING consumption of iron and steel products in the United Kingdom is foreshadowed in the latest production reports released by the British Iron and Steel Federation. According to this source, output of steel ingots and castings in April amounted to 991,500 tons, compared with 980,100 tons in March and 808,700 tons in April a year ago. So far this year each month's yield has shown an appreciable gain over its predecessor, the average for the four-month period of 955,450 tons contrasting with 794,475 tons produced comparably during 1935.

For 1935 as a whole average monthly output was even higher at 820,200 tons. On a seasonal basis, therefore, current British production would not appear to have reached its peak, and the 1936 monthly volume, based on percentage increase, should reach 986,387 tons. It is interesting to note that in 1929 monthly output was but 803,000, or approximately 2 per cent beneath last year's figure and 19 per cent beneath the estimate for 1936.

Great Britain's production of pig iron likewise is making headway. In April 629,800 tons was turned out, against 633,600 tons the month before but only 526,300 tons during April, 1935. The average so far in 1936 has been 610,900 tons monthly, which compares with 535,500 tons monthly for all of last year and 632,400 tons in 1929. Peak production, however, occurred in 1913 when 855,000 tons a month was produced.

There were 112 furnaces in blast at the end of April, five having been blown in and two put out of operation during the month.

Truscon Reduces Its First Quarter Loss

TRUSCON STEEL CO. lost \$66,198 during the first quarter after all charges including depreciation as compared with a net loss of \$158,077 for the first quarter of 1935.

"Because so many of Truscon's products go into the building industry, operations of the company normally show a seasonal decline during the winter months," stated A. E. Walker, president of the company. "With the growing activity in the building field which has materialized this year, opera-

tions of the company are now considerably higher and the sales outlook substantially better than was the case a year ago."

Armco Profits Off In First Quarter

AMERICAN ROLLING MILL CO., Middletown, Ohio, in the quarter ended March 31, had consolidated net profit of \$743,904

after depreciation, interest and Federal taxes, equivalent after preferred dividends to 34c. a share on average number of common shares outstanding. This compares with \$1,371,474 earned in the like quarter of 1935, equal to 78c. a share on the common stock then outstanding. For the 12 months ended March 31, net profit was \$3,683,541, equivalent after preferred dividends to \$1.94 a share on average amount of common stock outstanding during the period.

TWO OUTSTANDING VALUES IN PLATING BARRELS!

From the standpoints of high plating efficiency and durability to withstand the knocks of continuous operation, these are outstanding plating barrels. ■ The Udylite Plating Barrel is a high production barrel, capable of turning out load after load of well plated work for 24 hours each day. This unit is unquestionably the sturdiest and most efficient barrel plating unit built. ■ For the occasional handful or for production plating of very small parts, the Handiplater is the ideal unit. Compact, easily operated, efficient—this small outfit is an indispensable asset to any plating plant. ■ A request from you will bring complete details and prices on either or both of these outstanding plating barrels.

Have you received your copy of the Udylite Catalog? Write for it NOW.



UDYLITE PLATING BARREL



HANDIPLATER

Made of the strongest possible combination of materials—special shock-resistant rubber and steel—this plating barrel is built to last. All steel members are anodically charged; efficient insulation completely prevents "treating." Construction combines great strength with high plating efficiency. The Udylite Barrel is made in a variety of sizes and types depending on the production desired.

This small, inexpensive plater operates with a few gallons of solution taken from the regular still or barrel plating tank. Cylinder, which is detachable, has capacity ranging from a handful up to one-half peck. A sturdy, efficient unit from the rubber-lined steel cylinder to the fabricated steel base, the Handiplater represents an investment low in cost—high in utility value.

THE UDYLITE COMPANY

1651 E. Grand Blvd., Detroit, Mich.

New York
30 E. 42nd Street

Chicago
1943 Walnut Street

Cleveland
3756 Carnegie Ave.

San Francisco
114 Sansome Street



Metal Industries Threatened by Proposed Pennsylvania Tax on Fuel Oil

A BILL recently introduced in the general assembly of Pennsylvania would impose a State revenue tax of 2c. per gal. on all fuel oil sold or consumed in the Commonwealth of Pennsylvania.

In the eastern Pennsylvania district alone, metal-producing and metal-working companies consume more than 200,000,000 gal. of fuel oil each year, so the proposed tax would add \$4,000,000 annually to their operating costs. The burden on the entire State's metal-producing and metal-working industries would naturally be far greater.

At a hearing before the house committee on the bill in Harrisburg, May 20, Robert W. Wolcott, president, Lukens Steel Co., Coatesville, appeared as chairman of a special committee appointed by the Philadelphia Chamber of Commerce representing eastern Pennsylvania industry, opposed the bill

on the grounds that it would strangle the independent steel industry in Pennsylvania, greatly increase unemployment throughout the state and impose a crushing additional tax burden, particularly on small business.

Mr. Wolcott pointed out that his own concern uses from 20,000,000 to 37,000,000 gal. of fuel oil yearly, depending on business volume. The proposed tax would mean a payment by Lukens of from about \$1,000 to over \$2,000 for each day of the year. The total cost, between \$400,000 and \$750,000 yearly, could not be absorbed by Lukens, nor could the company add the tax to the selling price of its products, due to competition from producers in other States. To change back from fuel oil to producer gas, Mr. Wolcott stated, would require an expenditure of between \$750,000 to \$1,000,000 for equipment. The result of the tax,

if enacted, would be to make it impossible for the Lukens company to operate except at terrific loss and shutdown of the plant would be forced, with resulting unemployment to the company's 2500 employees. Mr. Wolcott pointed out that the Lukens plant is the only major industry in Coatesville, with most of the population of 14,500 depending directly or indirectly on Lukens, the vast majority of whom would be added to relief rolls.

A telegram sent to Governor Earle of Pennsylvania by Samuel Reeves, president, Phoenix Iron Co., Phoenixville, Pa., was made public, in which Mr. Reeves stated that the fuel oil tax would also cause a shutdown in Phoenixville, with loss of 2000 jobs in the iron works there.

At least eight other important units in the eastern Pennsylvania metal products industries would also be forced to move from the State or to close down, with resulting unemployment in the eastern part of the State alone of more than 20,000 people.

D. P. McConologue, representing

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FIRST, YOU MUST *will* TO REDUCE



all COSTS OF MATERIALS HANDLING

Elwell-Parker Trucks building stock piles of alloys, handling skid boxes containing 3,000-4,500 lbs. per trip. Because the owners willed to reduce handling costs on all their transportation, Trucks are handling a wide range of jobs throughout the plant, and are sharply reducing costs on every one.

MONEY SAVINGS begin when Management says: "we're paying too much for handling loads—costs have GOT to come down" and sends for the nearest Elwell-Parker Engineer to devise a System* that will keep loads hustling, with new economies.

But sometimes—even when Elwell-Parker Trucks, Tractors and Cranes seem to be covering all the big operations in a plant—Management overlooks *other* load-transportation jobs in which costs should come tumbling, too.

So it's not alone the *will* to cut costs, but the will to cut *all* costs, that counts most. Are Elwell-Parkers saving for *you*, at all the places where they *might*?

The counsel of Elwell-Parker Engineers should help you find new ways to cut costs in handling *your* plant loads. They represent 30 years' successful progress in applying Industrial Power Trucks to every major industry. Write or telephone. The Elwell-Parker Electric Company, 4225 St. Clair Avenue, Cleveland, Ohio.

* The Elwell-Parker System: Trucks, correct appliances, and a soundly engineered operating plan.

New **ELWELL·PARKER** *Trucks*

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906

Blaw-Knox Co., Pittsburgh Rolls Corp., Union Steel Casting Co., Lewis Foundry & Machine Co. and National Alloy Steel Co., also spoke at the hearing in opposition to the bill. Mr. McConologue stated it would cost nearly \$1,000,000 to change these plants back to another fuel. Even with such a change, they would probably not go back to coal but would utilize natural gas, thus effectively eliminating any benefit to the coal industry of Pennsylvania. Other representatives of metal industries pointed out that if forced to resort to coal, their most logical source of supply would be the West Virginia fields.

Among the representatives of the metal industries attending the hearing were Stanley White, General Steel Castings Co., Eddystone; J. K. Beeson, assistant general superintendent, Pittsburgh Steel Co., Monessen; C. C. Davis, Pennsylvania Forge Co., Tacony; William H. Chesnut, Baldwin Locomotive Works, Eddystone; P. A. Sexton, American Bridge Co., Pencoyd; George H. Lange, Phoenix Iron Co., Phoenixville; William D. Disston, Henry Disston & Sons, Tacony; James P. Platt, Alan Wood Steel Co., Conshohocken; Hugh Kenworthy and George M. Gillen, Lukens Steel Co., Coatesville.

* Carl Mayer Corp., 3030 Euclid Avenue, Cleveland, has been organized to manufacture complete line of industrial ovens and drawing and tempering furnaces. Carl Mayer is president and C. A. Vining, vice-president.

Refrigerating Machinery Makers Report Progress in Standardization Work

PERSONAL observations of the results of two widely differing governmental policies in the neighboring dominions of Australia and New Zealand by Willis H. Carrier, Carrier Engineering Corp., Newark, recently returned from a world cruise, were a feature of the 1936 spring meeting of the Refrigerating Machinery Association in Hot Springs, Va., May 14 to 16.

In New Zealand, Mr. Carrier related, governmental regulation and regimentation of business and agricultural activities are the current vogue. It has resulted in business stagnation and unemployment, lack of confidence, increased taxation, and a constantly mounting public debt. Australia, having been faced with virtual national bankruptcy only a few years ago as a result of political profligacy, had no further funds with which to experiment, Mr. Carrier continued, and consequently was forced to adopt a rigid economy and measures encouraging to industry and commerce. The resulting confidence has bred new business energy which has brought substantially increased employment and prosperity to Australia, while her neighbor-dominion, a few hundred miles away and trying a diametrically-opposed economic theory is facing a dubious outlook.

Great interest was manifested in the progress of the broad standardization program which has been carried on by the Refrigerating Machinery Association during the past year under the leadership of S. E. Lauer, vice-president, York Ice Machinery Corp., York, Pa., and chairman of the association's standards committee. The program, embracing all types of commercial and industrial refrigerating equipment, has shown a notable advance, particularly during the past seven months, because of the active and personal participation in the program by representatives of association member companies. Foremost in importance of the standards recommendations adopted by the association were a standard form of warranty and rules and regulations for use in connection with the testing, rating and rating certification of mechanical condensing units.

The need for a greater understanding by the general public of the leading role machinery has played and can play in the employment of a large part of the population of the United States was stressed by John W. O'Leary, president of Machinery and Allied Products Institute and former president of the United States Chamber of Commerce.

At the annual meeting of the Air Conditioning Manufacturers' Association, held in conjunction with the refrigerating manufacturers' meeting, an air conditioning applications code for the use of the association's members pending the drafting of a national code under the sponsorship of the technical societies interested in the air conditioning field, was presented and approved by the association. A review of the year's program showed that substantial progress had been made. Various standards were approved by the association, one of the most important of which was a form of warranty for use by association members.

The following were elected to office: J. F. G. Miller, B. F. Sturtevant Co., Hyde Park, Boston, president; J. A. Harlan, Kelvinator Corp., Detroit, vice-president; P. A. McKittrick, Parks-Cramer Co., Fitchburg, Mass., treasurer.

Granite City Steel Co., Granite City, Ill., has established a sales office at 200 Fifth Avenue, New York. James M. Bried is in charge.

Synthetic Molding Sand

We have "the makin's"

From our various sources you can get all the ingredients necessary for ideal synthetic sands for any type of metal—plus the services of foundry engineers to help you develop the mixtures to fit your particular needs.

Standard and special sizes of Ottawa Silica Sands—Lake Michigan Sands—Refracto Crude Silica—Refracto Fire Clay, mulled and screened—Wyoming Bentonite, extremely fine—Tuscora Milled Molding Sand, for blending.

[Let our engineers investigate your sand problem. Ask us about this service.]

GREAT LAKES FOUNDRY SAND CO.
United Artists Building Detroit, Michigan

Mineral Industries Conference Held

ATTRACTING a record attendance, the fourth annual mineral industries conference of Illinois, recently held at Urbana, won the approval of all who participated in it. Open forum discussions of research problems featured the program, giving the representatives of various Illinois mineral industries full opportunity to acquaint themselves with the nature of recent and current researches in their behalf and a voice in planning needed researches for the future.

Approximately 200 people attended the meetings, representing the executive and technical departments of coal, clay, clay products, petroleum, rock, and rock products industries throughout Illinois.

Oil Industry Is Spending \$1,000,000,000

THE oil industry in the United States, which is now producing, refining and distributing 1,000,000,000 bbl. of petroleum yearly, will spend approximately \$1,000,000,000 in 1936 with other industries for equipment and supplies, according to a survey by *The Oil and Gas Journal*. These record expenditures in all branches of the oil industry are now under way to keep pace with the increasing demand for petroleum products. The estimated expenditures for equipment and supplies in order to build new facilities and maintain those already in operation are as follows:

Divisions	Estimated Purchases
Producing	\$457,962,400
Refining	231,230,000
Marketing	150,000,000
Pipe Line	50,000,000
Transportation (marine and tanker)	43,000,000
Natural Gasoline	25,000,000
Total	\$957,192,400

The estimate does not include purchases made from manufacturers in the United States by foreign oil interests. This foreign market would increase the total to approximately \$1,000,000,000.

The survey points out that several factors are tending to expand oil company purchase this year. In the producing division operators must not only bring to the surface more crude oil than in any previous year to supply current demands, but they must discover new reserves for future years. Petroleum refiners are making up for the minimum expenditures during the depression years, in modernization

480 CHECKS AND INSPECTIONS INSURE THE QUALITY OF GENERAL ELECTRIC MAZDA LAMPS



Spherical photometers like this are used to determine a lamp's conformity of light output, watts and efficiency to ruling limits

General Electric manufactures 9000 varieties of lamps with one thing in common . . . all of them are of the high quality resulting from more than 40 years of research and development.

G. E. MAZDA lamps must pass 480 checks and inspections in manufacture before General Electric says they are economical and

efficient for your use. Many of these facilities used in safeguarding lamp quality are available for your inspection. The next time you are in Cleveland, you are cordially invited to see how we check and inspect these lamps . . . General Electric Company, Department 166 — Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC MAZDA LAMPS



and new construction programs never exceeded in the history of the industry. Over 50 major refinery construction programs now under way or recently completed throughout the United States are listed, with 25 in foreign countries.

Several major pipe line construction programs have recently been announced. Routine expenditures in the maintenance of existing lines will exceed those of previous years. New equipment in construction work this year in all branches of the industry has been outstanding. The publication points out that this reflects not only the dearth of used materials but also the remarkable efficiency of new equipment with assured savings to its users.

Steel Co. of Canada Commemorates Anniversary

THE Steel Co. of Canada, Ltd., Hamilton and Montreal, has issued a 60-page booklet entitled "The Twenty Fifth Milestone," commemorating its twenty-fifth anniversary. The booklet is handsomely illustrated and attractively printed and forms an interesting account of the history and accomplishments of the company.

Says Ancient Equipment Keeps Forging in Bow and Arrow Stage

SPEAKING before the Detroit Chapter of the American Society of Tool Engineers on May 14, R. E. W. Harrison, vice-president, Chambersburg Engineering Co., Chambersburg, Pa., indicated that the matter of using either air or steam on so-called "steam hammers" is largely a matter of economics. Sometimes steam is a waste product and its use is obvious. In general, steam is more economical in mass production work, but on jobbing work where the load factor is low, air is more economical. It should be remembered, however, that air leaks are more expensive than steam leaks. In fact, compressed air is about the most expensive commodity in the shop. It has been customary in the past to figure 16 cu. ft. of free air for every 100 lb. of falling weight, but by proper design this figure can be reduced to about 10 cu. ft. It is necessary to have a good supply of air adjacent to the hammers and the use of air receivers fed with large piping is essential.

The reason casting technic has replaced forgings to a certain extent in the past few years is because the comparison is often made on the basis of ancient forging

equipment. Mr. Harrison pointed out that 85 per cent of forging machines are over 10 years old according to a survey made in 1935, whereas only 65 per cent of all machine tools have passed that age. He considered that we are still in the bow and arrow stage of forge shop practice, compared to what is being done in the machine end of metal-working. Equipment is often in very poor condition besides. A 2000-lb. steam hammer, for example, which consumes 3550 lb. of steam an hour when in good condition, may consume as much as 5650 lb. of steam when in poor condition. This means that if such a hammer were converted to air use, the air losses and hence the expense of operation would be equally high on a percentage basis.

The tendency in the newer hammers is to use heavier tools. Where before a 2000-lb. hammer was considered adequate for a certain class of work, a 3000-lb. hammer is now used. The object is to complete the work in the minimum number of blows and in minimum time. There should be compensation for wear, and the frame must be rigid enough to keep the dies properly matched. One of the problems in a machine of this type is to take care of the dissipation of unused energy without damage to the machine. In this connection the ratio of anvil weight to the weight of falling parts has been increased in the last decade from 7½:1 up to 25:1. The higher ratios assure a better rebound of the falling weight. It is possible with hammers of this type to use dies of 3-deg. draft instead of the usual 7-deg. With a 3-deg. draft in the forging there is possibly from 60 to 70 per cent reduction in the amount of metal to be removed in subsequent machining operations.

There have been great improvements in die material in recent years. Chromium, nickel and molybdenum alloy die steels are now available, forged on six faces to produce grain refinement by hammering. The die blocks are very carefully heat-treated and are hardened to a high degree of uniformity. It is now possible to get a machineable alloy die steel with a hardness in the range of 62 to 63 Scleroscope. Over older materials, an average of 60 per cent more forgings is possible without recutting the impression. The practice of cutting dies has kept pace with the improvement of materials

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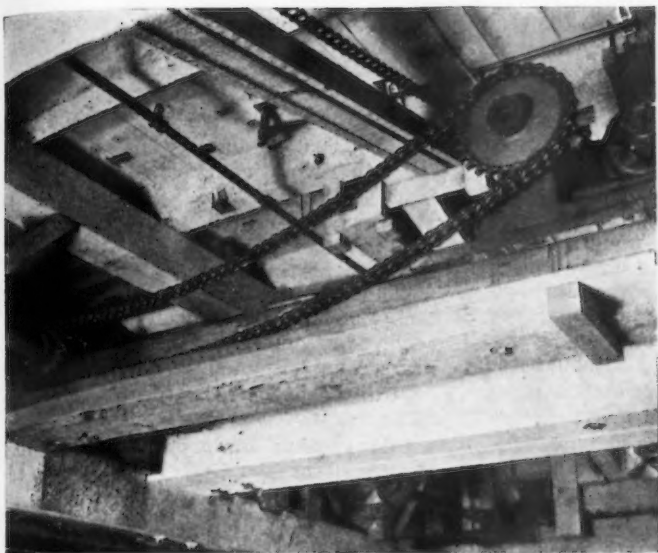
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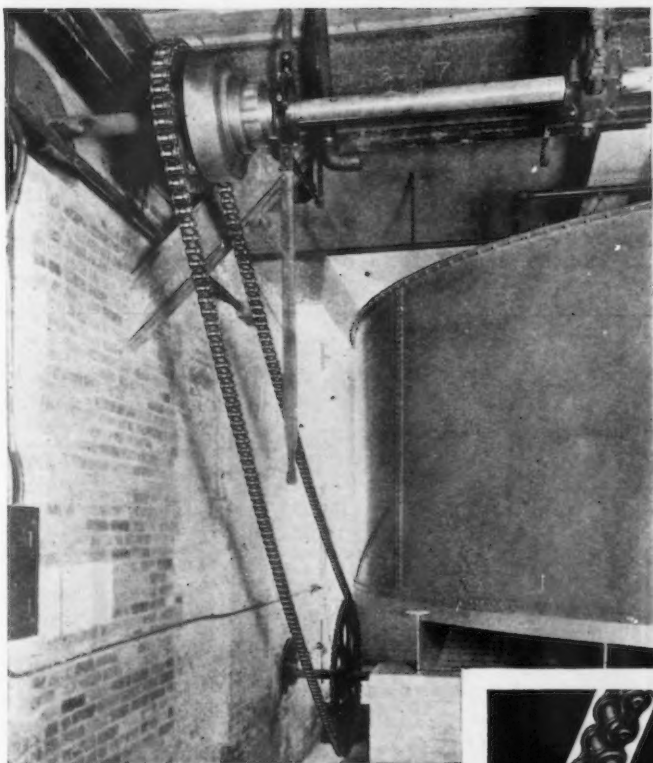
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and has brought about substantial reductions in the amount of hand correction.

On the basis of visits to approximately all of the 500 forge shops in the United States, Mr. Harrison concluded that furnaces are generally too small in area and are poorly constructed, often with loose bricks evident. When the furnace is too small, there is not sufficient soaking time and the forging is not heated uniformly throughout, often resulting in internal strains and changes in crystalline structure. Most forge shops operate on the batch method, with the work

thrown on the floor which may often have puddles of water. As a result, the first few forgings are water quenched, the top ones of the heap air cooled and the ones in between annealed. He proposed that some simple form of conveyor would result in more uniform cooling of forgings and would produce more uniform results, even though the pieces were subsequently heat-treated. At present layout is very poor and material handling methods extremely crude. Although the rest of the shop may be conveyorized, no one thinks of bringing conveyors into the forge shop.

Mechanization Topic At Mining Congress

Mechanization of the mining industry held the attention and constituted the leading discussion at the four-day meeting of the American Mining Congress in Cincinnati recently. More than 5000 members of the industry attended the sessions and inspected a display of \$2,000,000 worth of mining machinery.

Speakers at the various sessions explained that while machinery reduced the human factor in coal production, it tended to increase employment by giving opportunity for increased sales of fuel and augmented activities in other lines. In addition conditions among the

miners and employees of coal companies were described, as the result of the use of machinery.

"We find that mechanized mining pays good dividends in the better contentment of the people we employ as well as improved returns from our production," L. M. Thomas, vice-president of the Carbon Fuel Sales Co., Charleston, W. Va., told the delegates at the Wednesday session. "The people are happier and more contented and there are fewer strikes, fewer disturbances and better working conditions generally," he continued.

Discussing the idea of awards to workers, Eugene McAuliffe, president of the Union Pacific Coal Co., declared that "bonuses paid for meritorious service, expressed in the form of additional output

per man-hour, will not only reduce the cost of production, but will also tend to relieve the monotony of the day's work."

"The coal industry has gone through revolutionary changes; it is no longer backward," Paul Weir, vice-president of the Bell & Zoller Coal & Mining Co., Chicago, said in a further discussion of mining problems. "Production methods of today and tomorrow call for intelligent assembly of facts by engineers, analysis of those facts followed by a decision based on those facts and not on tradition."

One speaker declared that the enactment of the Guffey coal law and the social security act had forced mining companies to seek means of producing coal that will reduce the number of operatives to a minimum. It was also indicated that the same reason would stimulate purchases of machinery to bring about the cheaper operation of mines.

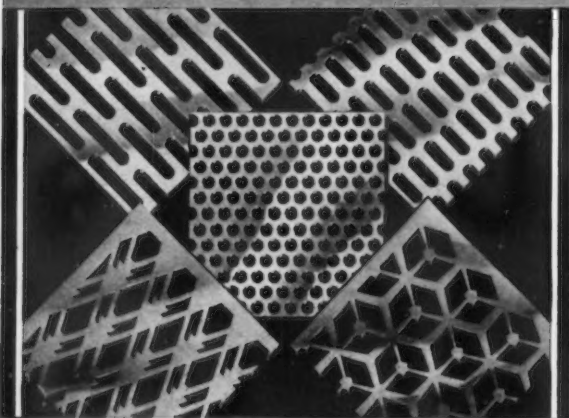
British War Minister Addresses Institute

The annual dinner of the Iron and Steel Institute (British) was held in London, May 7, with about 500 members and guests present. Sir Harold Carpenter F.R.S., the president, presided.

The chief guest, the War Minister, praised the research work which was being carried out by the institute, emphasizing that Great Britain could only maintain her position by producing steel of better quality, and more cheaply than her competitors. The world's industrial leadership in peace time would be held by the country which was the most efficient producer. Mr. Duff Cooper however, struck a warning note when referring to the present war cloud. Great Britain had at last determined to re-arm so as to strengthen her voice for peace in the world's counsels. The Government confidently appealed to the British steel industry for their support in this great task. It would be possible to prevent war by presenting to the world a British Empire devoted to peace, and so strong that nobody would willingly incur its disapproval. It was pointed out by the War Minister that in Britain today industry served the State whilst in its turn the State supported industry.

Sir William Larke, speaking on behalf of the British iron and steel industry expressed his gratitude that the politicians had reversed their previous policy, and were now assisting the industry. Admirable cooperation now existed between industry and Government. The

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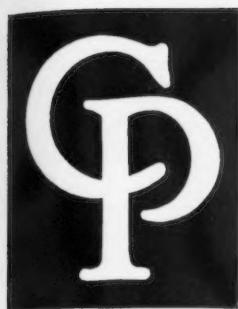
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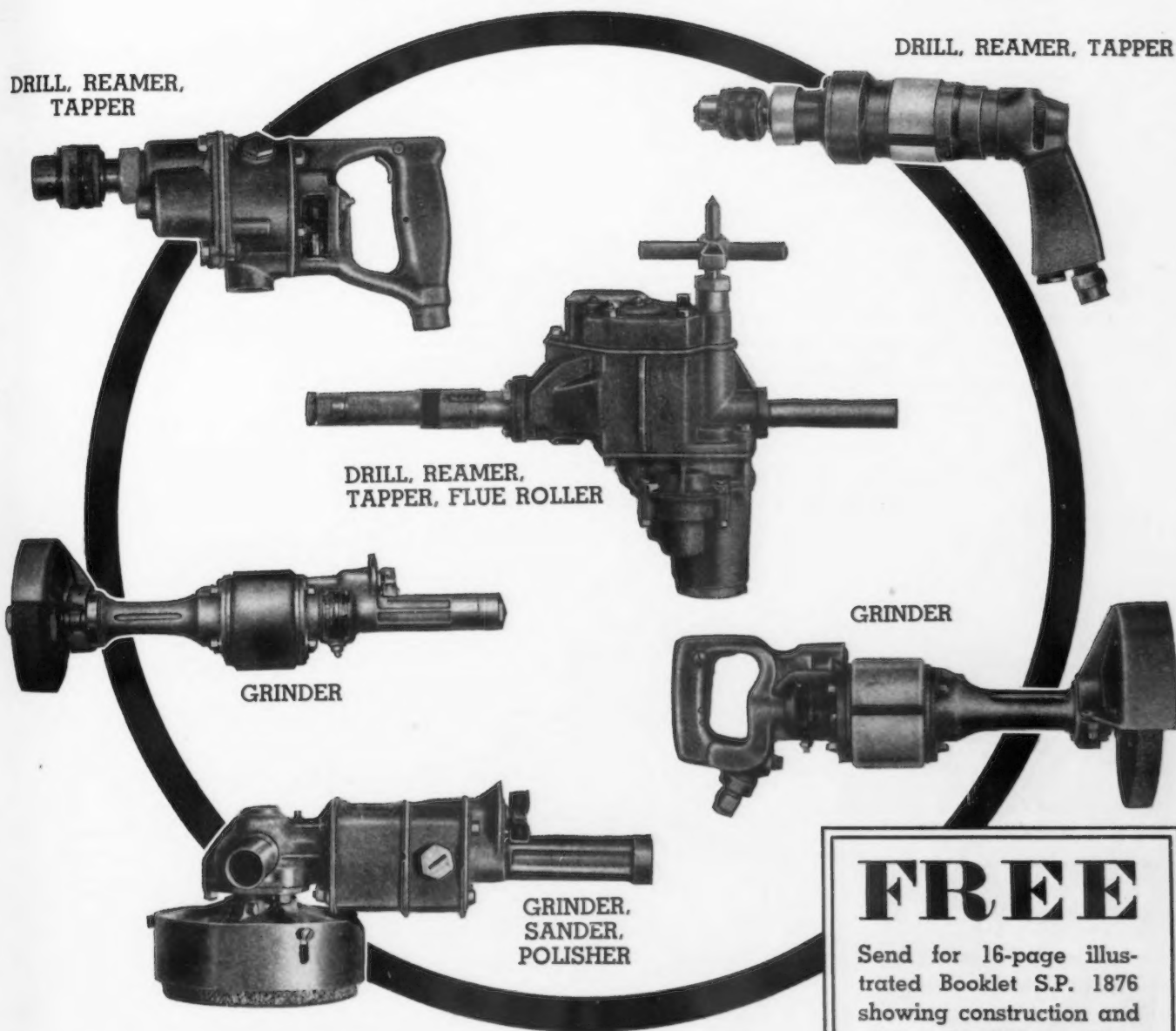
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CHICAGO PNEUMATIC

P-36-1

THE IRON AGE, May 28, 1936—79

price structure must meanwhile be controlled so that the process of recovery should not be interfered with. Sir William declared that the Government were not appealing in vain to the iron and steel industry. Whatever might be the demands of the State in the shape of sacrifices in men, material or wealth they would find the industry ready to serve.

Statistical Data on Steel Published

THE twenty-fourth annual statistical report on the iron and steel industry has been published by the American Iron and Steel Institute. As was the case in the preceding issue, 1935 figures covering total steel production include with steel ingots only that part of steel for castings which was produced by companies also making ingots.

Certain new data are included in the report. For the first time it has been possible to show the tonnage of iron and steel scrap consumed in blast furnaces and steel-making furnaces. Also avail-

able for the first time from this source are figures showing production of stainless steel ingots in 1934 and 1935, supplementing data covering tonnage of hot-rolled stainless steel and other alloy steel products which are included in the total production of finished hot-rolled products. Some of the tabulations have been changed in form for the sake of simplicity and clarity.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has placed an order for a new antenna tower for its radio station KDKA. The construction will involve approximately 60 tons of steel, and the vertical radiator, as the modern structures are called, will consist of a slender steel mast held erect by two sets of guys. The height will be 710 ft., and the entire weight will be supported on a single Westinghouse porcelain insulator only 18 in. in average diameter, which in turn will rest on a 6-ft. concrete pillar. Construction of the new tower will start as soon as necessary approval is obtained from the Federal Communications Bureau in the Department of Commerce, and will be located near Saxonburg, Pa.

Welding Conference Planned for Chicago

A WELDING conference, sponsored by the Hollup Corp., Chicago, in cooperation with a number of other companies, will be held at 2211 West Pershing Road, Chicago, June 4-6. Exhibits and demonstrations, afternoons and evenings, will be a feature.

JUNE 4

Twelve addresses on various welding topics have been arranged:

Recent Improvements in Shielded Arc Welding and Its Application, by A. M. Candy, Hollup Corp.
Arc Welding Costs Reduced by Cross Field Principle, by J. H. Blankenbuehler, Westinghouse Electric & Mfg. Co.

JUNE 5

Application of Electric Welding to Railroads, by E. E. Wanamaker, electrical engineer, Chicago, Rock Island & Pacific Railroad.

Bronze Welding and Brazing in Railroad Shops, by Homer Gannett, welding supervisor, Chicago, Burlington & Quincy Railroad.

Developments in Steel Welding, by Thomas Jones, welding superintendent, Illinois Steel Co.

Hard Surfacing and Welding of Manganese Steel, by E. L. Quinn, welding engineer, American Manganese Steel Co.

Welding of Nickel, Monel Metal and Inconel, by F. G. Flocke, International Nickel Co.

JUNE 6

New Developments in the Arc Welding Industry, by W. W. Reddie, Westinghouse Electric & Mfg. Co.

Welding of Class I Pressure Vessels (speaker to be announced).

Control of Expansion and Contraction by Local Heating of Cast Iron Parts, by Roy Peterson, bronze welding engineer, Burdett Oxygen & Hydrogen Co.

Automatic Shape Cutting (speaker to be announced).

Phos-Copper, by E. A. Randall, service engineer, Burdett Oxygen & Hydrogen Co.

Operators Welcomed Guffey Act Decision

PITTSBURGH, May 26.—Despite popular opinion to the contrary, those coal operators in this territory, representing 60 to 70 per cent of the total production of bituminous coal, have been and still are much opposed to Government interference in the coal industry. The recent decision of the Supreme Court has been gratifying to them, as they say they will now be able to work out the industry's salvation among themselves without outside interference, provided that no new legislation like the Guffey act is passed.

In rebuttal to the criticism as to why they have not done something themselves during the past 10 years or so, operators counter with the statement that until the Supreme Court, in March, 1933, handed down the Appalachian sales agency deci-

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sion, they were forbidden by the Sherman law to do anything toward stabilizing prices. Obviously before this decision, any attempt to fix prices in any direction would have resulted in charges of Sherman law violation. However, the Supreme Court showed the way whereby operators might organize into a sales agency with the object in mind of establishing a fair market price for coal, which would enable producers to earn a reasonable profit and maintain proper wage schedules, thus eliminating cut-throat competition which has exerted disastrous effects upon the industry for quite some time.

It was only two months after this decision that the NRA came into existence and, of course, the operators were unable to establish the sales agency since the NRA more or less attempted to set up some sort of control. After the NRA was knocked out by the Supreme Court, agitation for the Guffey bill was started, with the result that an intricate control in the form of legislation was passed. This move again prevented these operators from attempting to establish a program along the lines suggested by the Supreme Court in March, 1933.

With the Guffey bill now declared unconstitutional, the way is adequately paved for the industry, with the help of past experience and the Appalachian decision, to attempt to put its house in order through negotiations among oper-

ators and labor officials. In the meantime, producers in this district see no disastrous effects as far as labor is concerned, since union contracts have been signed which do not expire until April, 1937. Operators here are confident that cut-throat competition and unfair trade practices can be eliminated through cooperative effort, which has thus far been prevented. Any further Government control legislation will only postpone the time when the operators will be able to work out the difficulties in the coal industry in their own way.

Buyers Expect Firm Commodity Prices

A FIRM trend in commodity prices is forecast for the coming 6 to 12 months in the summary of national business conditions released for the guidance of 1200 members of the National Association of Purchasing Agents, gathered in New Orleans for the 21st annual international convention of the organization. The report, prepared by a committee of buyers headed by Frederick J. Heaslip, of Fairbanks, Morse & Co., Chicago, recommends that industrial buyers of the country maintain a policy of "being well covered" on essential materials.

"The fact that this is an election year," Mr. Heaslip said in

releasing his committee's report, "will have no decided effect upon business. Purchasing executives, and most economists of the nation, are convinced that the upturn in industry has gathered sufficient headway to be impervious to political agitation."

The purchasing agents' regular report on business conditions is looked for each month because policies suggested have a decided influence on the purchasing done by industrial buying executives who spend upwards of \$20,000,000,000 annually for raw materials, mechanical equipment and other products used by productive manufacturers.

According to the committee's summary, May business maintained the levels established in April in all sections of the country except the West where a decided improvement in general conditions was noted. Commodity prices showed a steady trend through the nation. Inventories were kept to the preceding month's levels and companies showed a decided tendency to cover in advance on requirements. In the East orders covered requirements for two to four months in advance. In the Mid-West coverage was one to three months, in the West two to three months and in Canada one to two months.

Employment is up in the West and generally unchanged in other sections, the report shows.

Employee Relations in Steel Industry

"THE Men Who Make Steel" is the title of a booklet just published by the American Iron and Steel Institute, in which prominence is given to the development and practice of cooperation between employees and management in the steel industry.

The booklet points out that since labor seeks a wage from industry, management a salary, and capital seeks a return on its investment, the aims of each group are identical.

The friendly relations which exist between employees and employers in the steel industry are attributed by the booklet to the successful operation of the employee representation plans which steel employees have adopted to preserve close contact with management. Some of these plans have been in existence for more than 30 years. Under these plans the employees annually elect representatives from their own number to

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represent them in dealings with the employers.

These representatives take up not only such basic questions as wages, hours and working conditions, but also employee problems relating to safety, sanitation, health, transportation, improvements in shop practice, cost reduction, quality of production, service to customers, education, recreation, athletics and housing.

Bantam Ball Bearing Expands Again

THE Bantam Ball Bearing Co., South Bend, Ind., is adding new machinery and building an addition to its plant at a cost of \$250,000. This new expansion gives an additional area slightly greater than the addition which was built last year which gave the factory a 60 per cent increase in floor space.

A. H. Frauenthal, vice-president and general manager, stated that the company's business has increased over 800 per cent since 1932. The Bantam company manufactures both roller and ball bearings in sizes ranging from 1/32 of an inch to 60 in. in diameter.

Youngstown Places Mills with United

YOUNGSTOWN SHEET & TUBE CO. has placed orders for two 4-high mills with United Engineering & Foundry Co. in its program for expansion of tin plate output at the Indiana Harbor, Ind., plant. The purchases involve a 42-in. cold reduction mill and a skin pass mill, which were authorized by Youngstown Sheet & Tube Co. in a \$1,300,000 appropriation for additional capacity at the Indiana Harbor plant. A reversing mill for the same plant was purchased from United Engineering company in 1933 and the new orders are laid to the performance of the prior installation. The new mills will be built from the same basic designs as formerly, except that the skin pass mill will include special processing equipment.

The United company will start production on the order immediately and delivery will be made in the fall. The reversing mill will handle coils up to 8000 lb. in tin plate gages with a length of more than a mile. The material will be annealed in coil form in conformity with a new practice, then temper passed on the skin mill, which is of United Engineering design, and especially developed for deepest-drawing tin plate.

Ford Offices to Be Air-Conditioned

FORD MOTOR CO. has announced it has embarked upon two-year program calling for installation of air-conditioning equipment in all its administrative offices of its principal branches in this country. The entire program will require two years to complete, and is estimated to cost \$260,000.

Work will be started immediately

in offices of the company's branches at Edgewater, N. J.; Somerville, Mass.; Chester, Pa.; Chicago; Kansas City; and Dallas, Tex., and is expected to be completed before hot weather sets in.

The home office, together with several neighboring establishments, was air-conditioned in the spring of 1935, whereas certain "constant-temperature" rooms, in which important inspections of manufacturing precision are made, have enjoyed air-conditioning facilities for an even longer period.

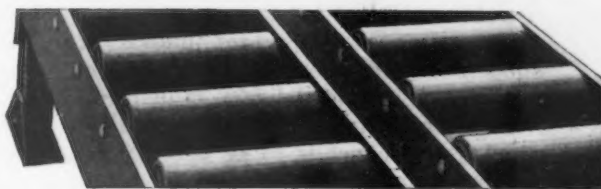


5 1/2" Roll 3/4" wall seamless steel .40 carbon. No. 90 bearing has 3/4" balls—solid outer and inner races. Capacity 8000 lbs. per roll.

For jobs where the going is rough

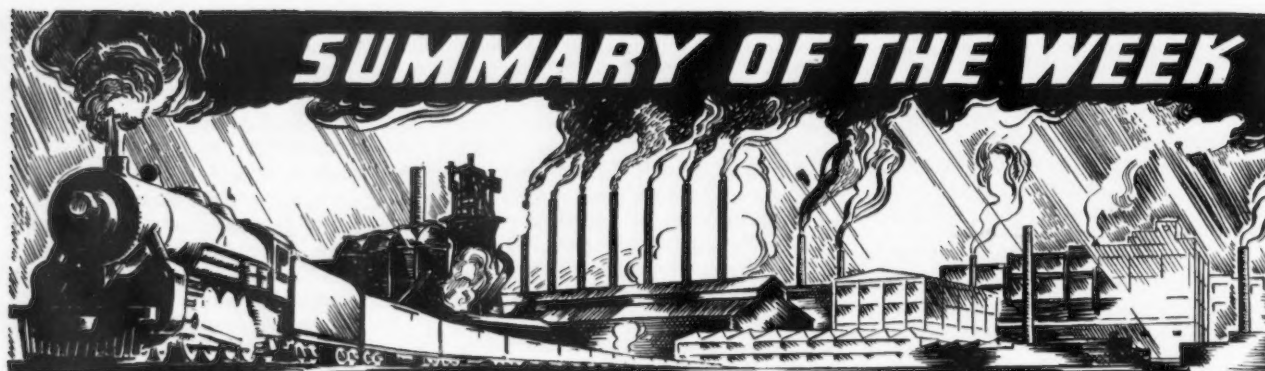
● Handling coils weighing up to 25,000 lbs., conveying extra-heavy piles of sheets, absorbing unusual loading shocks—these are typical conditions for which the Pressure Lubricated No. 90 bearing was designed. Method of lubrication through shaft to rear of bearing, forces out old grease around periphery of outer shield—floating steel cup prevents entry of grease into interior of roll. Outer shield of steel does not touch any rotating part. NO FELT WASHERS . . . all-steel seals give complete protection with minimum friction loss. Life of sealing members is indefinite. The nearest Logan engineer can tell you more, or write on your letterhead, for Steel Mill Conveyor Bulletin. LOGAN CO., Inc., 545 Buchanan St., Louisville, Ky.

Note: There are other types and sizes of Logan Rolls for all requirements—with capacities ranging from 25 pounds per roll to 8000 pounds per roll. Complete information on request.



Logan Conveyors

LOUISVILLE



... Third quarter price advances of \$2 a ton affect principal steel products.

o o o

... Orders for June delivery are expected to be stimulated sharply.

o o o

... Output is well maintained with ingot operations off only half a point to 68 per cent of capacity.

PRICE advances for third quarter have been announced by leading producers of semi-finished steel, bars, plates and shapes, all grades of sheets and hot-rolled strip steel. The increase amounts to \$2 a ton on all products except cold-finished carbon steel bars which will go up \$3 a ton. Third quarter quotations on wire products, tubular goods, rails, track accessories and cold-rolled strip have not yet been named.

Cold-rolled strip is slated for an advance of at least \$2 a ton. Rails may be marked up to \$40 a ton. Certain revisions are expected on merchant wire products, but pipe is not expected to be changed. Skelp has already been reaffirmed at 1.80c. a lb., all basing points. Tin plate will not be changed in the midst of the canning season.

THE new schedules, which have been formally published by at least one important producer of steel, contain one important innovation in that all quotations and sales will be made f.o.b. place of delivery. Place of delivery is defined as the railroad freight station at or nearest the place at which the product is to be used. If the place of delivery is at a basing point a switching charge of 2½c. a 100 lb. is added to the base price to obtain the delivered price. Chicago and Gary are exceptions, the switching charge at those points being 3c. a 100 lb. At other points of delivery, prices will be determined as under the code.

As the new prices are not effective on shipments before July 1, consumers will be given opportunity to cover all their needs which can be shipped before that date. If this deadline is rigidly observed, June shipments should be very heavy; in fact, June should be the best month of the year for the steel industry. However, it is felt that it will be physically impossible to satisfy customer requirements of low-priced steel in the five weeks remaining in this quarter, and some carry-over of business into July can scarcely be avoided.

STEEL deliveries today are still considerably delayed and many users who had become accustomed to meeting their needs from day to day are hard pressed for tonnage. This is particularly true in the case of tin plate. Tin mills are nearly all engaged at capacity and are turning away casual customers who characteristically shop around for their needs.

Raw steel output is very well sustained, ingot production this week being off only half a point to 68 per cent of capacity. Operations are off slightly at Chicago, Philadelphia and Cleveland, but have gained at Buffalo and St. Louis and are unchanged at Pittsburgh and Wheeling.

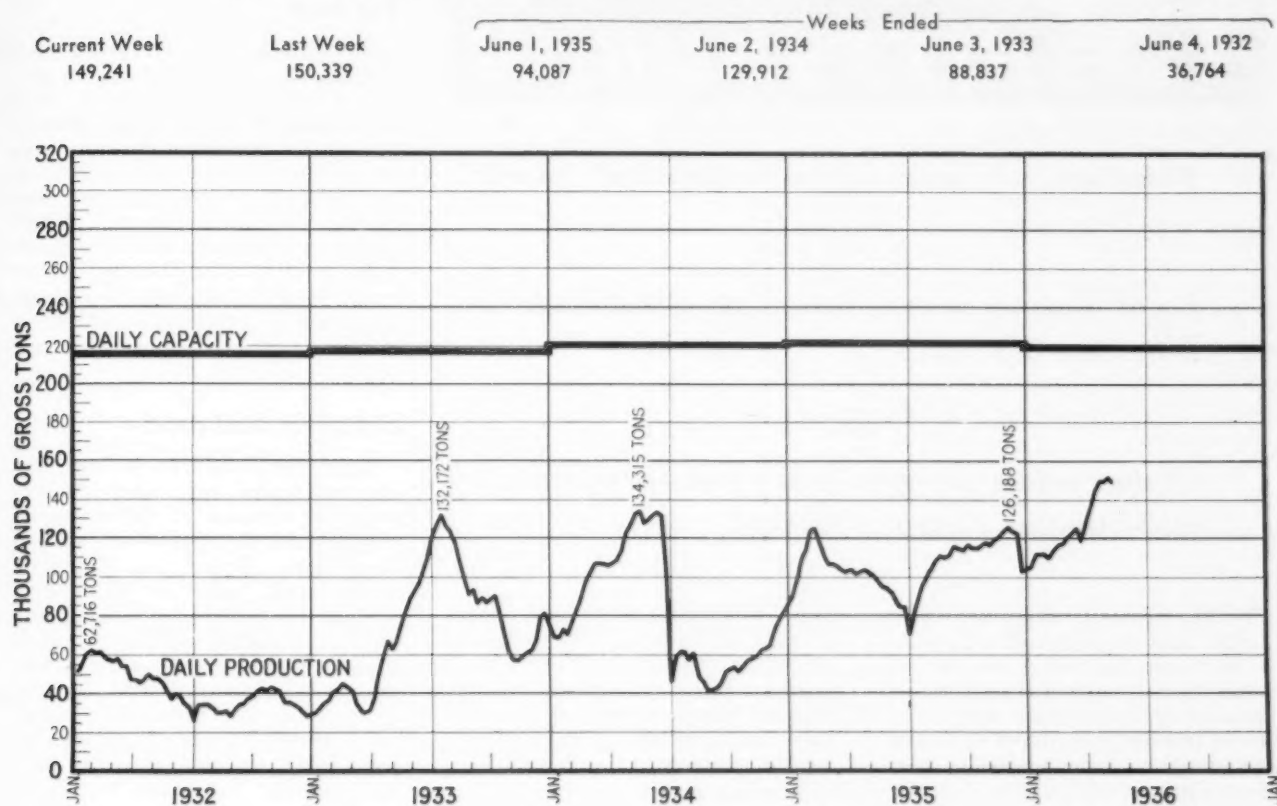
AUTOMOTIVE requirements are definitely declining, but are still substantial enough to maintain sheet and strip mill operations at a high rate. One large producer reports that its sheet orders from refrigerator, stove, washing machine tub and air-conditioning equipment makers are now larger than its aggregate automotive takings.

Freight car orders include 5400 for the Chesapeake & Ohio, 500 for the Pere Marquette and 1000 for the Norfolk & Western. The New Haven has bought 10 locomotives. The week's fabricated structural steel awards of 11,900 tons compare with 34,720 tons in the preceding period, but new projects increased from 10,865 tons to 27,400 tons.

SCRAP prices have again declined, THE IRON AGE composite for No. 1 heavy melting steel having settled to \$13.08 a gross ton because of a 50c. drop at Philadelphia. The finished steel composite, which will not be affected by price advances until July 1, remains at 2.097c. a lb., while pig iron is holding at \$18.84 a gross ton.

STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936



STEEL INGOT PRODUCTION BY DISTRICTS:

Per Cent
of Capacity

District	Current Week	Last Week	Weeks Ended		
			May 2, 1936	June 1, 1935	June 2, 1934
Pittsburgh	63.0	63.0	65.0	36.0	49.0
Chicago	65.0	67.0	67.0	43.5	65.5
Valleys	74.0	74.0	74.0	50.0	63.0
Philadelphia	44.0	45.0	45.0	32.0	45.0
Cleveland	72.0	74.0	76.0	45.0	67.0
Buffalo	76.0	73.0	65.0	41.0	57.0
Wheeling	90.0	90.0	90.0	68.0	74.0
Southern	67.0	67.0	67.0	50.0	63.0
Ohio River	77.0	80.0	85.0	65.0	60.0
Western	77.5	80.0	90.0	30.0	35.0
St. Louis	82.0	77.5	80.0	21.0	60.0
Detroit	100.0	100.0	100.0	95.0	100.0
Eastern	85.0	85.0	90.0	35.0	55.0
Aggregate	68.0	68.5	69.0	42.5	59.0
Average Year to Date	59.0	58.6	57.0	47.8	46.8

Weekly Booking of Construction Steel

FROM THE IRON AGE

	Week Ended				Year to Date	
	May 26, 1936	May 19, 1936	Apr. 28, 1936	May 28, 1935	1936	1935
Fabricated structural steel awards.....	11,900	34,720	14,125	6,250	427,720	319,700
Fabricated plate awards.....	550	1,940	8,675	2,175	112,960	71,250
Steel sheet piling awards.....	0	1,275	0	2,150	16,975	23,945
Reinforcing bar awards.....	5,760	4,800	2,850	5,040	156,490	110,870
Total Lettings of Construction Steel....	18,210	42,735	25,650	15,615	714,145	525,765



... Third quarter price advances dominate market.

o o o

... Ingot output maintained in Pittsburgh and Wheeling districts.

o o o

... Higher prices promise heavy June demand, with mid-summer slump promised.

PITTSBURGH, May 26.—With the announcement of a \$2 a ton increase for third quarter on semi-finished and the majority of finished steel products early this week, interest is centered on prices. Although no announcements have been made as yet on pipe and wire products, action of some kind is expected almost momentarily.

In line with the increase on hot-rolled bars, the price of cold-finished carbon bars has been raised \$3 for third quarter delivery. As a result of these announcements, it is quite reasonable to suppose that the trend of steel operations during June will either remain at present levels or increase, as many consumers, notably non-integrated mills, will probably purchase as much material as possible before the third quarter prices become effective. If this should happen it would probably mean that ingot output during the last half of July and August will drop off sharply from previous levels.

Meanwhile steel ingot production in the Pittsburgh district remains at 63 per cent, and in the Wheeling district the rate of 90 per cent is still holding. With the exception of wire products and strip, demand is persisting along recent lines, with mills being continually pressed for shipments, especially in the hot-rolled bar category.

Specifications for plates and shapes are coming in at about the same rate as a week ago, and are receiving quite some support from railroad car builders. A large number of the recent cars ordered will be fabricated in and around

this district. Structural steel awards continue to show evidence of private project building, which is encouraging, considering the fact that so much structural business has been coming from public-financed projects.

Demand for tubular goods is playing its part in maintaining steel production, there having been no change from recent levels. The most recent line pipe project is a 178-mile 6-in. gasoline line for the White Eagle division of Socony-Vacuum Oil Co., to run from Augusta, Kan., to Kansas City, Kan.

Bolt, nut and rivet business is at a good level, due in a large measure to support from the railroads. Both demand and production of wire products are off this week, and this item represents about the slowest moving steel product.

Sheet production this week ranges from 59 to 63 per cent, and specifications, while not declining rapidly, nevertheless continue to ease off slightly, and the same may be said for hot-rolled strip.

Tin plate production, on the other hand, remains at practical capacity. However, producers feel that this operating rate can hardly be maintained much longer. There is evidence that tin plate stocks have been moving, since shipments have been slightly more than actual production during the past week.

While the movement of pig iron, due to stabilized prices, has been mostly in carload lots, nevertheless shipments this month are better than during April. Support has been derived mainly from good operations in steel foundries. Move-

ment of coal to the Lakes from this district has shown a perceptible increase over a week ago, with a tendency toward further improvement.

Pig Iron

Since the recent satisfactory activity in steel foundries is continuing, it is reflected in a freer movement of pig iron. As pointed out before, although the tonnages are not necessarily large, the total movement is at a better level than during the first quarter. While prices of finished products have been raised, the feeling in the trade seems to be that third quarter prices for pig iron will be a reaffirmation of those in effect for second quarter.

Semi-Finished Steel

Carnegie-Illinois Steel Corp. has opened books for third quarter with an advance of \$2 a ton on rerolling billets, forging billets and sheet bars. Prices are quoted on a delivered basis at Pittsburgh within the switching district, and are as follows: rerolling billets and sheet bars \$30.50 a gross ton, and forging steel billets \$37.50 a gross ton. The switching charge on carload lots at Pittsburgh is equivalent to 50c. a gross ton. Skelp prices have been reaffirmed at 1.80c. a lb., base, or 1.82½c. delivered Pittsburgh. Meanwhile demand and movement of semi-finished material remains unchanged from a week ago.

Bolts, Nuts and Rivets

Demand from railroad car builders takes the spotlight in this market following several large building program releases in the district. Automotive buying is holding up well, but is expected to ease off shortly. No announcements have as yet been made for third quarter deliveries. However, in view of the increases announced for finished steel products, higher prices for bolts, nuts and rivets will probably result.

Bars

Prices for hot-rolled bars for third quarter are up \$2 a ton to \$1.97½ a 100 lb., delivered within the Pittsburgh switching district. Meanwhile current demand for hot-rolled bars continues at the recent rate, with many mills from two to three weeks behind in deliveries. Bookings represent a wide variety of sources, and while specifications from the automobile industry have been tapering off within the past several weeks, no precipitous drop is expected for a

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished

Per Gross Ton:	May 26, 1936	May 19, 1936	Apr. 28, 1936	May 28, 1935
Rails, heavy, at mill	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	28.00	28.00	28.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	28.00
Slabs, Pittsburgh	28.00	28.00	28.00	27.00
Forging billets, Pittsburgh	35.00	35.00	35.00	32.00
Wire rods, Nos. 4 and 5, P'gh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.85	1.85	1.85	1.80
Bars, Chicago	1.90	1.90	1.90	1.85
Bars, Cleveland	1.90	1.90	1.90	1.85
Bars, New York	2.20	2.20	2.20	2.15
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.09
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06 1/4	2.06 1/4	2.06 1/4	2.06 1/4
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	1.95
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Cold-rolled sheets, No. 20, Pittsburgh	2.95	2.95	2.95	2.95
Cold-rolled sheets, No. 20, Gary	3.05	3.05	3.05	3.05
Wire nails, Pittsburgh	2.10	2.10	2.10	2.60
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.65
Plain wire, Pittsburgh	2.40	2.40	2.40	2.30
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.35
Barbed wire, galv., P'gh	2.60	2.60	2.60	3.00
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	3.05
Tin plate, 100 lb. box, P'gh	\$5.25	\$5.25	\$5.25	\$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	May 26, 1936	May 19, 1936	Apr. 28, 1936	May 28, 1935
No. 2 fdy., Philadelphia	\$21.3132	\$21.3132	\$21.3132	\$20.3132
No. 2, Valley furnace	19.50	19.50	19.50	18.50
No. 2, Southern Cincinnati	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham	15.50	15.50	15.50	14.50
No. 2, foundry, Chicago	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.	20.8132	20.8132	20.8132	19.8132
Basic, Valley furnace	19.00	19.00	19.00	18.00
Malleable, Chicago	19.50	19.50	19.50	18.50
Malleable, Valley	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago	25.2528	25.2528	25.2528	24.2528
Ferromanganese, seab'd car-lots	75.00	75.00	75.00	85.00

*This quotation is for delivery in South; in the North prices are 38c. a ton under delivery quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	\$14.25	\$14.25	\$15.75	\$11.75
Heavy melting steel, Phila.	12.25	12.75	13.50	10.50
Heavy melting steel, Chicago	12.75	12.75	14.37 1/2	10.25
Carwheels, Chicago	13.50	13.50	14.00	10.50
Carwheels, Philadelphia	13.75	13.75	14.50	11.25
No. 1 cast, Pittsburgh	15.25	15.25	15.25	13.25
No. 1 cast, Philadelphia	14.00	14.00	14.00	11.25
No. 1 cast, Ch'go (net ton)	12.00	12.00	12.50	9.00
No. 1 RR. wrot., Phila.	14.75	14.75	15.00	10.25
No. 1 RR. wrot., Ch'go (net)	11.50	11.50	12.50	8.00

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	\$3.65	\$3.65	\$3.65	\$3.85
Foundry coke, prompt	4.25	4.25	4.25	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	9.50	9.50	9.50	8.75
Lake copper, New York	9.62 1/2	9.62 1/2	9.62 1/2	9.12 1/2
Tin (Straits), New York	46.00	45.90	46.80	51.75
Zinc, East St. Louis	4.90	4.90	4.90	4.30
Zinc, New York	5.27 1/2	5.27 1/2	5.27 1/2	4.67 1/2
Lead, St. Louis	4.45	4.45	4.45	4.20
Lead, New York	4.60	4.60	4.60	4.35
Antimony (Asiatic), N. Y.	13.50	13.50	13.50	12.75

The Iron Age Composite Prices

Finished Steel

May 26, 1936	2.097c. a Lb.
One week ago	2.097c.
One month ago	2.097c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

	HIGH	LOW
1936	2.130c., Jan. 7	2.084c., Mar. 10
1935	2.130c., Oct. 1	2.124c., Jan. 8
1934	2.199c., April 24	2.008c., Jan. 2
1933	2.015c., Oct. 3	1.867c., April 18
1932	1.977c., Oct. 4	1.926c., Feb. 2
1931	2.037c., Jan. 13	1.945c., Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29
1928	2.286c., Dec. 11	2.217c., July 17
1927	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$18.84 a Gross Ton
18.84
18.84
17.83

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH	LOW
18.84, Jan. 7	18.84, Jan. 7
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17
18.59, Nov. 27	17.04, July 24
19.71, Jan. 4	17.54, Nov. 1

Steel Scrap

\$13.08 a Gross Ton
13.25
14.54
10.83

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH	LOW
14.75, Feb. 25	13.08, May 26
13.42, Dec. 10	10.33, April 23
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.08, Dec. 3
16.50, Dec. 31	13.08, July 2
15.25, Jan. 11	13.08, Nov. 22

week or so, if then. Material being shipped has been for actual consumption. However, with price increases certain for third quarter delivery, it is not without reason to expect anticipatory buying during the month of June, since all material at second quarter prices must clear the mills by June 30.

Steel Sheet Piling

This market is quiet this week. Bids have been taken by the Department of Interior, Bureau of Reclamation, at Denver, for two tonnages, one involving 161 tons and the other 370 tons, to be used on the All-American Canal project. One large job is pending at Buffalo, and the award will probably be announced soon.

Reinforcing Steel

New inquiries are still spotty, although production and delivery on specific job projects remain at recent levels. As yet there is no indication concerning prices for the third quarter. Announcements on other finished products will no doubt accelerate action on this question.

Cold-Finished Bars

Aggregate demand for cold-finished material during this month has exceeded that in April. With the possible exception of a drop in automotive specifications, activity remains at about the same levels recently reported. Orders are well diversified, with warehouse customers also figuring in on total tonnages being taken. Prices for cold-finished carbon bars will be \$3 higher for third quarter delivery, while cold-finished alloy bars will be up \$2.

Plates and Shapes

Prices on structural shapes and plates have been announced for the third quarter, and represent a \$2 a ton increase over second quarter quotations.

Specifications for plates and shapes are about on a par with last week, and, as reported, this particular market will be fairly active, due to further increased railroad car building. Of the 3500 steel gondola cars to be built for Chesapeake & Ohio Railroad, the majority will be fabricated in and around this district. Pressed Steel Car Co. has received orders for 500 steel hopper cars from Norfolk & Western.

Private projects this week total about 50 per cent of the structural awards, most of them being for new buildings or additions to buildings. The balance of the awards are composed chiefly of highway bridge projects. However, 1300 tons is involved for a nurses

residence at St. Luke's hospital in New York. Inquiries are mostly for highway bridges.

Tubular Products

Demand for tubular goods remains at about the same level as previously reported, with a little more activity evident in the movement of standard pipe. Jobbers' stocks have reached a low point, and many of them are now in the market for replenishment. Total tonnage, however, does not assume large proportions. Interest in line pipe orders is being sustained with the news that the White Eagle Division of Socony Vacuum Oil Co. will build a 6-in. gasoline pipe line from Augusta, Kan., to Kansas City, extending for 178 miles. Such an order, if full weight, would approximate 8500 tons. As yet prices for third quarter have not been announced.

Wire Products

Demand for wire products has again leveled off slightly during the past week, with the market for merchant wire being extremely dull. Prices for third quarter have not been announced.

Sheets

In line with increases on other finished steel products, third quarter quotations on sheets will be \$2 a ton higher. Effective May 21, the extra for tack plate quality sheets was advanced from 20c. to 30c. a 100 lb. Demand is at about the same pace as a week ago, though there seems to be a further tendency for it to ease off. However with the certainty of higher prices in the third quarter specifications will probably increase over present amounts during the month of June. Production is off a few points this week, and will probably average around 59 to 63 per cent.

Tin Plate

Operations in the tin plate industry remain at practical capacity, with incoming specifications for packers' requirements showing no let-up. Producers are still being rushed for material to be used in the making of oil cans, and production of tin plate for milk cans is rapidly reaching its peak. It is not believed by producers that the present break-neck speed of production will hold out much longer than a week or so. The mills are this week shipping more tin plate than is being produced, and this tendency will increase, with the result that stocks which have been high will be depleted.

Strip Steel

Quotations for third quarter delivery for hot rolled strip reflect a

\$2 per ton increase. Demand, if anything, is slightly down this week, with further decreases in orders from automotive interests. The balance of tonnages being booked, however, still show a wide and healthy diversification. No doubt, increased prices for the third quarter will result in some anticipatory buying during June.

Coal and Coke

Movement of industrial coke remains unchanged from last week. Movement of coal to the Lakes has increased perceptibly this week over last. This is undoubtedly due in some measure to clarifications concerning the Guffey act. Producers feel that from now on Lake movement will increase, with the result that this year's tonnage reaching the Lakes will be much greater than last year.

Fairless to Address Warehouse Meeting

B. F. FAIRLESS, president Carnegie - Illinois Steel Corp., Walter S. Tower, executive secretary, American Iron & Steel Institute, and Charles M. White, vice-president Republic Steel Corp., will address the American Steel Warehouse Association, Inc., at its 27th annual convention, which will be held at the Edgewater Beach Hotel, Chicago, June 10, 11 and 12. Appearance of these speakers reflects the interest steel makers are taking in the problems of distribution for their products.

Speakers from the warehouse industry will include Lester Brion, president Peter A. Frasse & Co., Inc., New York, president of the association, who will discuss the broad aspects of association service to its members and will suggest a basic program for future activities; E. L. Parker, president Edgar T. Ward's Sons Co., Pittsburgh, who will outline the advantages of cooperation between the steel warehouse group and other groups representing important supply sources and Walter S. Doxsey, executive secretary, who will review the work done by the association during the past year.

Committee chairmen will make reports on the year's developments relating to major products handled by steel warehouses including hot and cold-rolled steel and specialties, such as stainless and tool steel and tubular products. Group luncheons have been arranged for the first two days of the meeting and a banquet followed by a program of entertainment will be held June 11.



... Price advances are likely to make June banner month of year.

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... Ingot production drops two points to 65 per cent of capacity.

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... Current sales are nearly up to best level of year.

CHICAGO, May 26.—With existing backlogs and incoming business from lines of consumption that appear to be endeavoring to make up time lost during the depression, steel operations in this area will be at a fairly high level in June. While the weighted average of ingot output is down two points to 65 per cent this week, the loss is attributed mostly to a closing down of a few open-hearths for repairs.

Sales and specifications are above the totals of the last two weeks and close to the best period of the year.

From every standpoint June carries the prospect of being the banner month of the year. If this is finally borne out by fact, it will be due largely to the covering expected against price increases scheduled to become effective July 1. It is intimated that all producers of the district will meet the \$2 a ton advance in the price of plates, shapes and bars and also in semi-finished steels announced by Carnegie-Illinois at Pittsburgh. There have been some rumors of plans to raise wire prices, but these lack confirmation.

Producers assert there is every reason to believe that because of the advanced buying and the improvement in the fields of consumption that have lagged in the last three years, operations will be held at fairly stable levels during the summer, although some decline could naturally be expected in that period as a result of the normal recessions in automotive and farm implement demand.

The prevailing opinion is that prices on railroad materials will not be disturbed. Producers have until September to ship material

bought prior to July 1. Virtually all railroad tonnage of the last week represented contract releases. Liberal specifications on plates and other materials, including wheels and axles, came from car builders.

A gradual improvement in the plate demand is in outlook. Tank makers, as well as car builders, have active programs ahead. More piling is being taken for construction jobs. Fabricators generally report an improved prospect. While public works are supplying the bulk of the current structural tonnage, it is regarded as significant that an increasing number of private projects are coming to light.

Pig Iron

New business continues steady. Shipments at the present rate will show a gain of better than 25 per cent over the April movement. Books are to be opened shortly for the third quarter. The outlook is for unchanged prices. New business suggested by the announced advance in semi-finished and finished steel prices is expected to take up whatever slack might result from a decline in automobile assemblies. This has already been indicated by a reduction in output of malleable castings for parts makers. Output of castings for railroad car parts has shown some increase and further gains in the line are expected during the summer.

Wire Products

Demand for plain and spring wire has declined, primarily because of the decrease in automotive orders, but business from that industry has held up better than was anticipated earlier in the season. Decreases also have been shown in

the needs of other manufacturers, but this is regarded as no more than seasonal. Current business in wire nails compares favorably with that of other normal years. A similar report is made for wire fencing and barbed wire, although buying for country use is somewhat restricted.

Rails

New business is lacking, except for miscellaneous lots aggregating only 200 tons, yet specifications continue fairly liberal. Rail units of the district are operating at a little above 50 per cent. Backlogs are sufficient to guarantee operations at or close to this figure until September. Reaffirmation of the current \$36.37½ per ton price is expected for the third quarter. Under the existing plan all rails bought prior to July 1 may be shipped through all of the third quarter.

Bars

Demand has tapered as a result of the decreased needs of the implement division of the farm implement industry and the slowing of automotive output. Production of farm tractors continues at the previous high rate and may continue well into the summer. Resumption of full scale operations is scheduled for late October or early November, as is the case in any normal year. Current output of this material, however, is at about the same rate as it has been over the last several weeks with backlogs sufficient to indicate a steady scale of operations through most of June. Some stimulation to new business is expected as a result of the \$2 a ton price increase to become effective July 1.

Structural Steel

Producers' reports of increased sales and specifications supplement the statements of fabricators that business is more active and that an increasingly active period lies just ahead. Current demand is coming largely from public works, although a greater number of private jobs are being booked. The latter is regarded as a favorable element in the long-term outlook.

Plates

Mills continue to operate at recent high averages. Liberal specifications are reported from car builders who have increasingly active programs for the remainder of the spring and summer. More of this material also is going into construction work. An increasing demand is reported for water tanks and also for oil storage. A large tonnage in covering orders is expected next month as a result

of the \$2 a ton price increase to become effective July 1.

Sheets

Despite the decline in automotive needs, units of this type will be busily engaged through the remainder of this quarter. Some decline in operations is expected about the middle of June, which will mark the beginning of retooling preparations of the automotive industry, although some of that work has already started. Demand from other consumers has held about steady, although there is evidence of easing up in the total. An improved business in galvanized roofing sheets has been shown in farm areas this year, but demand from the producing industry has been restricted through previous coverage by jobbers at lower prices. All companies are expected to follow the advance of \$2 a ton in the price of sheets announced by a leading producer.

Strip

Producers report better organization in this department. All recent congestion has been relieved and shipments are going out more promptly. Production continues in about the same volume as it has been over the last few weeks, yet a let-up is expected shortly as a result of the slowing down in automotive needs.

Reinforcing Bars

Attractive tonnage projects except for highway bridge and slab work are rather scarce. Private undertakings, though appearing now and then, account for little of the tonnage passing through shops. Illinois is making general contract awards of 700 tons of road work. Holabird and Root, Chicago architects, are designing a new Wieboldt department store. Chicago has money allotted for new school buildings, but action is not being taken pending a study whether to build new structures or add to buildings which have not been completed. Some shops are still operating near capacity and in at least one case bookings extend ahead for 45 days.

Cast Iron Pipe

The 5500 tons needed by Cicero, Ill., will be purchased by Leninger Construction Co., Chicago, which has been awarded the contract subject to WPA approval. Evanston, Ill., has opened bids on 900 tons of 30-in. pipe and Oshkosh, Wis., has placed 200 tons. About 60 per cent of present orders is resulting from old WPA work, whereas new tonnage from that source accounts for most of the remainder of the tonnage reaching foundry books.



... German machine tool exports increase 72 per cent.

o o o

... Shipyards book heavy orders.

HAMBURG, May 18 (by special correspondence). — German machine tool manufacturers report a rising demand on all world markets. It is particularly remarkable that Russia, which in 1935 bought very little in the machine tool line, has increased her purchases in the first quarter of this year from 318,000 marks to 5,200,000 marks. Another interesting increase was the advance in machine tool exports to the United States from 118,310 marks in 1935 to 714,000 marks this year. Total exports amounted to 27,800,000 marks, compared to 16,100,000 last year.

The average value of machine tools shows an increase of 162 marks per ton compared with last year, and the advance in average prices indicates that higher quality machinery is being exported than was the case in 1935. Purchasers from overseas increased their orders more than did those on the Continent. The industry is operating at 91 per cent of capacity and many makers have sufficient orders to keep them busy until the first quarter of 1937.

The German ship-building business is still active. A whaling fleet of one main boat of 22,000 tons and six tugs was ordered by a German margarine factory. A workmen's holiday organization which already operates a fleet of 42,000 tons, ordered a holiday ocean cruiser of 25,000 tons in March, a 22,000-ton ocean steamer in April and another vessel, of 15,000 tons, in May. When these orders are completed continuous ocean cruising of 16,000 workmen in 8 to 14-day trips will be regularly scheduled. A 15,000-ton tanker was ordered by an American company and two more passenger boats totaling 19,000 tons have been placed. Ship plate prices have been advanced 2s per ton and the demand continues to very heavy.

The Japanese and European steel tube industries (gas tubes only) have made an agreement whereby Japan orders 10,000 tons of tubes

annually from European makers for distribution in Manchukuo and Japan and stops competition by dumping in the Near East.

The Mannesmann steel works, which heretofore has not made steel bars, is building a new plant with an annual capacity of 100,000 tons of bars and is entering the German steel bar cartel.

A German company in Cologne has secured the contract for construction of 3000 km. of railroad line between Nachand and Pingchiang in China and will also supply the rolling stock. Orders have already been placed for eight heavy locomotives and 100 cars, with more material to follow. The Henschel works has obtained an order for 47 locomotives and boilers from India and nine locomotives from Latin-American countries.

In the last quarter of 1935 and the first of 1936 Italy ordered heavy quantities of steel and various other products, including large amounts of machinery, in the non-sanctionist countries of Hungary, Austria and Germany.



... New England industrial activity well ahead of one year ago.

o o o

... Foundry melt still spotty.

BOSTON, May 26.—Woolen mill operations are tapering off somewhat, but New England industrial groups otherwise are holding their own or doing a shade better. Steel mill operations at Worcester, Mass., and Bridgeport, Conn., are holding at previous levels, and Phillipsdale, R. I., now operating two furnaces, expects to have the third going late this week.

The Mystic Iron Works has invited the members of the New England Foundrymen's Association to attend the blowing in of the Everett, Mass., furnace on June 10. The Eastern Malleable Iron Co. is running 15 to 20 per cent ahead of a year ago, and leading copper and brass fabricators 20 to 50 per cent. New England plants of the General Electric Co. are between 20 and 25 per cent busier than a year ago, while the Westinghouse Electric & Mfg. Co., East Springfield,

Mass., plant now employs 4400, up 100 for the week.

On the other hand, the foundry melt is still very spotty and has increased little if any. Pig iron buying as a rule is confined to small tonnages for nearby shipment, but one Buffalo furnace representative booked 1400 tons the past week, some of it earmarked for third quarter delivery. Sales by other furnaces were very much smaller.

Billings by steel warehouses average around 40 per cent ahead of a year ago. Warehouse prices, with the exception of those for galvanized sheets, which are materially lower, are unchanged. Galvanized sheets, 24 gage, in 50-bundle or larger lots, are now 4c. a lb.



... Railroad inquiries dominate market.

... General steel demand is maintained.

ST. LOUIS, May 26.—Railroad requirements continue to take the lead in interest in this market. The St. Louis Southwestern has asked authority to expend \$1,933,203 for 25 miles of 112-lb. rails, 100,000 rail anchors, five 4-8-4-type locomotives, 50 automobile cars, five air-conditioned passenger coaches to cost not exceeding \$45,000 each, and to equip steel sides and automobile doors to 100 box cars and 50 steel underframes to trucks of flat cars. Judge Davis will have a hearing on the application on June 19.

The Chicago & Illinois Midland is also reported to be preparing to buy an unstated number of locomotives and coal cars.

The American Refrigerator Transit Co. is expected to place its order for 1000 refrigerator cars on June 1.

The State of Illinois will open bids on Friday for highway projects, requiring 900 tons of structural steel and 400 tons of reinforcing bars.

Business in all kinds of finished iron and steel continues at a lively rate. Deliveries on sheets and wire products are about two weeks behind.

The melt of pig iron in St. Louis and surroundings continues to be

maintained at recent high levels. It is expected that in the agricultural implement belt there will be a slight tapering off of operations about June 15, when the plants will close on Saturday, more to benefit employees than because of any slackening of orders, which continue heavy. There has been a slight let-up, too, in operations of stove foundries in Belleville.



... Southern pig iron shipments increasing.

... Ensley rail mill to shut down June 15.

BIRMINGHAM, May 26.—Pig iron shipments have begun to improve and the market is expected to show more life in June, as foundries have been steadily absorbing stocks accumulated in the first quarter. Quotations continue on a base of \$15.50.

Plates and structural shapes still are the chief items in steel demand, but new tonnage has lagged a little during the past two weeks. Sheet buying showed a slight improvement last week. This is expected to continue on a moderate basis in June.

The Bessemer, Ala., plant of the Nashville Bridge Co. has booked 100 tons of structural steel for an overhead crossing project in Baton Rouge Parish, La., and Ingalls Iron Works is fabricating in its Birmingham plant part of a 4000-ton order for an incinerator in New York, the remainder to be fabricated at its Verona, Pa., plant.

Within the next three weeks the Bessemer, Ala., plant of the Pullman-Standard Car Mfg. Co. will begin production of 100 phosphate cars for the Seaboard Air Line. The award of this order was reported several weeks ago.

The Ensley rail mill will be closed on or about June 15 for an indefinite period, according to an announcement made last week. This will also bring a reduction in blast furnace and open-hearth operations at the Ensley works.

Reports from Nashville state that the Tennessee Products Corp.

is to blow in its Rockdale furnace early in June.

Steel and iron production is unchanged, with 12 blast furnaces and 15 open-hearths in operation.



... Large pipe line to be let this week.

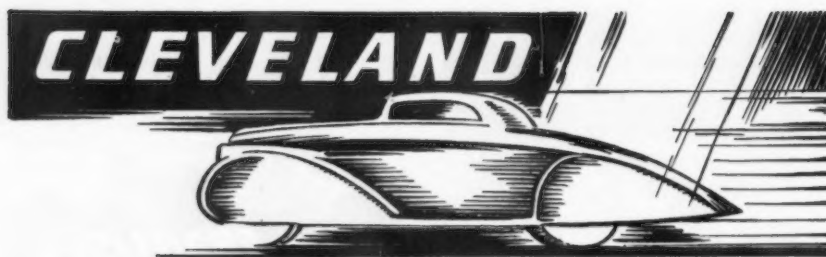
... Southern Pacific freight cars to be let

SAN FRANCISCO, May 26.—Activity in southern California is to a large degree responsible for the West Coast's rapid recovery and high rate of production which on many products exceeds that of the nation's. Structural and plate lettings have made favorable gains over the corresponding period of last year but reinforcing bar demand has been most brisk. Flood control, State and Federal highway structures, water and power projects and the return of industrial production and construction have all contributed to the upswing.

The Macy Street subway in Los Angeles accounted for 1400 of the 1750 tons of bars taken by Blue Diamond Corp. during the past week. Consolidated Steel Corp. received 825 tons of the total lettings of 4841 tons of bars. The same company will furnish 820 tons of structural steel for the Eagle Mountain pumping plant, near Los Angeles, and a bridge at Ventura, Cal.

Shell Oil Co. has bids under advisement at Los Angeles for approximately 25,000 tons of 6 to 12-in. steel seamless pipe and lettings are expected during the week. Bids were opened today by the Los Angeles Department of Water & Power on the Stone Canyon pipe line in which 7780 tons of 36-in. welded pipe is specified. At San Francisco the Newport News Shipbuilding & Dry Dock Co. appears to be the low bidder on two 14,500-ton freighters for the Matson Navigation Co. Moore Dry Dock Co., however, is low on one alternate and but slightly higher on the other three. Approximately 4000 tons of shapes and 6000 tons of plates are involved.

The Southern Pacific Co., it is reported, will take bids in June on 18 locomotives. Bids on the 2800 box and gondola cars, involving 5000 tons of steel, will be opened in San Francisco on June 1.



... Price advances expected to stimulate June orders.

o o o

... Ingot production off two points to 72 per cent of capacity.

o o o

... Chesapeake & Ohio and Pere Marquette order 5900 freight cars.

CLEVELAND, May 26.—Price advances of \$2 a ton have been made for the third quarter on most finished and semi-finished steel products. The advances so far announced cover hot-rolled carbon steel bars and small shapes, plates and shapes, all grades of sheets, hot and cold-rolled strips, hot-rolled and cold-finished alloy bars, sheet bars, and both carbon and alloy billets, blooms and slabs.

Cold-finished carbon bars have been advanced \$3. No advance is expected on pipe and a change on wire products is doubtful. Fall discount terms on fence and steel posts have been announced, effective June 1. The restoration of the old \$40 price on standard rails is expected, railroads to be allowed to order at present prices during June for delivery through the third quarter. The cost of forging billets under 5 x 5 in. down to 4 x 4 in. will not be increased, the advance in the base being offset by a corresponding reduction in the size extra. The price changes have been announced by several producers and others are expected to make similar revisions.

Ingot output in the Cleveland-Lorain territory dropped two points this week to 72 per cent of capacity, one local open-hearth furnace having been taken off. The Republic Steel Corp. started up its Central Alloy blast furnace at Massillon yesterday.

Specifications for finished steel are holding up well, although there has been quite a little slowing down in the demand from the motor car industry that is now buying only in small lots for finishing production schedules on its new models. As many consumers will be inclined to stock up at present prices, a spurt in the volume

of business during June is expected as a result of the price advance. However, mills announce their intention to take no more business at the present prices than they can ship by June 30.

The Chesapeake & Ohio Railroad has placed 5400 freight cars and the Pere Marquette, 500. Accessories for these cars are expected to be bought by the car builders within the next week or two.

Pig Iron

Pig iron sales have increased in number over April, but tonnage ordered is somewhat less. The gain in orders is due to using up of stocks that were taken in at the old price before April 1. Buying is in small lots for immediate needs. Demand from motor car foundries is holding up well. Books will be opened June 1 for the third quarter and the \$19.50 price for foundry and malleable iron is expected to be affirmed. Republic Steel Corp. shortly will begin casting of merchant iron in small pigs at its Cleveland furnaces. These will weigh about 40 lb. each, being about the same size as the piglets that are now being made by two other producers in this territory.

Semi-Finished Steel

A change in size extras on forging quality billets has been announced by one maker with a \$2 a ton advance on blooms, billets, sheet bars and slabs. The extra on forging billets under 5 x 5 down to 4 x 4 in. is reduced from \$4 to \$2 a ton, making this extra the same as has prevailed on 5 x 5 to 6 x 6-in. billets.

Sheets

A \$2 a ton price advance on all grades is announced for the third quarter. The volume of business

is being maintained around recent levels. Motor car manufacturers continue to buy in rather small lots to round out their stocks for finishing production on present models. Business continues to come in in good volume from makers of refrigerators, stoves and washing machine tubs. Business has been stimulated the past few days by placing of orders by some consumers in anticipation of higher prices before the price advance was announced.

Strip Steel

A spurt in new orders for both hot and cold-rolled strip in considerable tonnage came during the week from some of the large automobile parts plants, which are said to be increasing their schedules in spite of the downward tendency in automobile production. This business was for immediate shipment. Miscellaneous demand is fair. A price advance of \$2 a ton has been announced on both hot and cold strip for the third quarter.

Bolts, Nuts and Rivets

Sales have declined somewhat this month as a result of the falling off of business from the motor car industry due to the approaching changes in automobile models. Makers are getting cleaned up with orders from this source. Railroads and implement manufacturers continue to order freely and miscellaneous demand is fair.

Bars, Plates and Shapes

Bars continue in fairly heavy demand from forge shops and miscellaneous consumers. Tube round bars are active. Demand for structural shapes in small lots for private building work has improved. New Ohio inquiries are pending for five bridges requiring 625 tons. With the price advance, the Cleveland bar base for the third quarter will be 2c. a lb. and the Cleveland delivered price on plates and shapes, 2.095c.

Describes Foundry Use of Molybdenum

IN a beautifully illustrated booklet, the Climax Molybdenum Co., 500 Fifth Avenue, New York, describes the use of molybdenum in cast iron and steel. The effects of alloy additions on the physical properties and micro-structure of iron and steel are presented in a concise and easily understood manner, and a chart is included to show the amount of ferro-molybdenum required for any quantity of iron. Copies of this booklet may be obtained by writing to the company.



... Awards decline to 11,900 tons from 34,720 tons last week.

o o o

... New projects in good volume at 27,400 tons as against 10,865 tons in the previous week.

NORTH ATLANTIC STATES

Newfields, N. H., 175 tons, State highway bridge, to American Bridge Co.

Buffalo, 245 tons, buildings, to Ernst Iron Works.

Corning, N. Y., 680 tons, shipping building for Corning Glass Works, to American Bridge Co.

Batavia, N. Y., 380 tons, State highway bridge, to Bethlehem Steel Co.

White Plains, N. Y., 335 tons, Borden milk station, to Bethlehem Steel Co.

Broome County, N. Y., 110 tons, highway bridge, to Wisconsin Bridge & Iron Co.

Binghamton, N. Y., 950 tons, North high school, to Leach Steel Co.

Delaware-Otsego Counties, N. Y., 480 tons, highway bridge, to American Bridge Co.

New York, 1270 tons, St. Luke's Hospital, nurses' home, to Bethlehem Steel Co.

Philadelphia, 110 tons, St. Matthew's parochial school, to Belmont Iron Works.

Rockville, Md., 355 tons, road bridge, to American Bridge Co.

Washington, 410 tons, lookout towers for United States Department of Agriculture, to Aermotor Corp.

SOUTH AND SOUTHWEST

Atreco, Tex., 175 tons, Visbreaker furnace, to Belmont Iron Works.

Payne County, Okla., 160 tons, bridge, to J. B. Klein Iron & Foundry Co.

Nowata County, Okla., 125 tons, bridge, to Capitol Steel & Iron Co.

Major County, Okla., 125 tons, bridge, to J. B. Klein Iron & Foundry Co.

Pinal County, Ariz., 125 tons, State highway structure, to an unnamed bidder.

CENTRAL STATES

Winton Place-Cuba, Ohio, 325 tons, two bridges for Baltimore & Ohio Railroad, to Bethlehem Steel Co.

Negaunee, Mich., 500 tons, highway bridge, to Bethlehem Steel Co.

Dearborn, Mich., 450 tons, recreational building, Ford Motor Co., to R. C. Mahon Co.

Pontiac, Mich., 225 tons, store building for S. S. Kresge Co., to R. C. Mahon Co.

Peoria, Ill., 165 tons, court enclosure, to Gage Structural Steel Co.

Peoria, Ill., 450 tons, addition Caterpillar Tractor Co., to Mississippi Valley Structural Steel Co.

Danville, Ill., 185 tons, highway bridge, to Vierling Steel Co.

Clinton County, Ill., 195 tons, bridge, to Stupp Brothers Bridge & Iron Co.

Henry County, Ill., 195 tons, bridge, to Vierling Steel Co.

Blackhawk County, Iowa, 120 tons, two I-beam spans, to Pittsburgh-Des Moines Steel Co.

Rose Hill, Iowa, 195 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Waukesha, Wis., 100 tons, high school addition, to Lakeside Bridge & Steel Co.

WESTERN STATES

State of Montana, 175 tons, bridges in Musselshell and Silver Bow Counties, to unnamed bidders.

American Falls, Idaho, 100 tons, State overhead crossing, to an unnamed bidder.

Garfield, Utah, 1075 tons, converter flue for American Smelting & Mfg. Co., to Minneapolis-Moline Power Implement Co.

Long Beach, Cal., 240 tons, Spencer Kellogg Co. mill building, to Minneapolis-Moline Power Implement Co.

Ventura, Cal., 500 tons, County bridge over Santa Clara River, to Consolidated Steel Corp.

Los Angeles, 320 tons, Eagle Mountain pumping plant, to Consolidated Steel Corp.

San Francisco, 150 tons, hopper dredge for United States Engineers, to General Engineering & Dry Dock Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Dyer Brook, Me., 152 tons, bridge over railroad.

Turner Falls, Mass., 650 tons, bridge for New York, New Haven & Hartford Railroad.

New York, 12,000 tons, new building in Rockefeller Center, West Forty-ninth Street.

State of New York, 770 tons, four highway bridges.

Newark, N. J., 150 tons, warehouse for United Color & Pigment Corp.

Philadelphia, 2650 tons, junior high school; McCloskey & Co., low bidder.

THE SOUTH

Beaumont, Tex., 9200 tons, Neches River bridge.

CENTRAL STATES

Lansing, Mich., 750 tons, building for Fisher Body Corp.

State of Indiana, 1050 tons, six highway bridges.

La Crosse, Wis., 1000 tons, Cass Street bridge, Mississippi River; bids soon.

State of Wisconsin, 155 tons, bridge in Dunn County; bids opened May 8 rejected; new bids close June 5.

State of Wisconsin, 250 tons, bridge in Rusk County; bids June 5.

WESTERN STATES

State of Wyoming, 375 tons, three scattered highway bridges.

State of Montana, 175 tons, bridge for Northern Pacific Railroad over West Gallatin River.

Sacramento, Cal., 467 tons, State overhead crossing at Jibboom Street; bids advanced to June 10.

Los Angeles, 250 tons, bridge on Inglewood Boulevard for United States Engineers; bids May 27.

Benewah, Idaho, 144 tons, State overpass east of Plummer; bids May 29.

FABRICATED PLATES

AWARDS

Omaha, Neb., 305 tons, six barges for United States Engineers, to Deaby Corp.

Seattle, 250 tons, pipe line on East Marginal Way, to Puget Sound Machinery Depot.

NEW PROJECTS

Los Angeles, 7780 tons, 36-in. welded pipe for Stone Canyon pipe line; Southwest Welding & Mfg. Co., low bidder.

Kelvinator Introduces Low-Cost House

THE ultimate solution to the housing shortage which faces this country today is to provide a home which will contain all modern conveniences and improvements and sell at a price within reach of families of moderate income.

A big step in this direction has been taken by Kelvinator Corp., Detroit, which after extensive research, and with the recent addition of a group of specialists and technicians in the housing field, is preparing to utilize its experience as the basis for the establishment of the Kelvin Home. This home, which will embody every comfort known to science in a new form of American living, will offer electric refrigeration, electric cooking equipment, air-conditioning apparatus and automatic heating facilities.

The Cold Metal Process Co., whose Youngstown plant was completely destroyed by fire some time ago, has concluded negotiations with the Sharon Steel Corp. to use the latter's Haselton plant in Youngstown, until such time as the Cold Metal Process Co. determines where it will permanently locate.



... Third quarter price advances affect wide list of steel products.

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... Tubular goods, skelp, tin plate and rails not yet increased.

o o o

... Mills pushed for tin plate deliveries.

NEW YORK, May 26.—The leading Eastern producer has made public announcement of price advances of \$2 a ton, effective on shipments beginning July 1, on blooms, billets, slabs, sheet bars, plates, structural shapes, carbon and alloy bars, hot-rolled strip and all grades of sheets. Skelp has been reaffirmed at 1.80c. a lb., Coatesville, Pa., or Sparrows Point, Md. It is expected that cold-rolled strip will be increased \$2 and that a \$3 a ton advance will be made on cold-finished steel bars.

No change has yet been made in prices on tubular goods and it is expected that current discounts will be reaffirmed. On tin plate, no price revision can be made in the midst of the canning season and no action is expected to be taken on the rail price.

Prices on manufacturers' wire were advanced \$3 a ton at the beginning of this quarter, but many merchant items were reduced. Changes will probably be made. No action has yet been taken on rods.

The market on reinforcing bars has been so weak in recent months that many makers feel that some market stability should be apparent before price revision is undertaken. However, the new price of 1.95c., Pittsburgh base, on hot-rolled merchant bars is \$4 a ton over the price to distributors on reinforcing.

As price changes have been the center of interest during the last week, little attention has been paid to the current state of demand. Consumers had been inclined to discount price action, and even now will be given an opportunity to cover many of their third quarter needs during June.

It is understood that efforts will

be made to have all tonnage booked at the old prices shipped before July 1, but this will be a physical impossibility in many instances. It is also expected that much material will be booked at the extreme end of the quarter which will have to move out during July. The latter eventuality would be welcomed in some quarters as it would help to ease the inevitable slump in business which follows a price advance.

Deliveries on many forms of steel are still somewhat congested. Operations are at a high rate and mill equipment is often not in condition to make further gains feasible. Under the circumstances some business is actually being turned away. The situation in tin plate is particularly tight. Practically all mills are running at capacity and consumers are offering tonnage to unaccustomed sources of supply in order to secure deliveries.

Heavy railroad car orders have been placed in the last week and the New Haven has ordered 10 locomotives. Construction steel is active, and another unit of Rockefeller Center, requiring 12,000 tons of shapes, is out for bids.

Pig Iron

Demand has not strengthened materially, but in some directions consumer needs are more urgent, as indicated by orders to ship new carlot quantities immediately and by improved specifications against contracts. No volume of inquiry to speak of is circulating as a result of buyers' policy to put off commitments until need arises. Steady, if not expanding, recent shipments, reported by the majority of sellers, would indicate that evidently more iron has been sold this quarter than has been talked

of. While prices are expected to be reaffirmed, no sellers have as yet made an announcement.

Reinforcing Steel

The reinforcing bar market continues rather quiet this week. Sellers manage to keep occupied on small lots of relatively unimportant tonnages, since of late there have been no large jobs available. The general opinion in the trade is that prices are improving gradually but are still far from the desired position. Unless further postponement is made, bids on the 800 tons of bars for the housing project in the Bronx will be opened May 27.

New Protective Zinc Coating Introduced

THE corrosion-resisting properties of zinc are such that it has had wide use as a protective coating on other metals, notably steel. To further these protective qualities, and to insure corrosion protection in extreme applications, the New Jersey Zinc Co. has just announced and patented a new process known as the New Jersey Zinc Co.'s Cronak process.

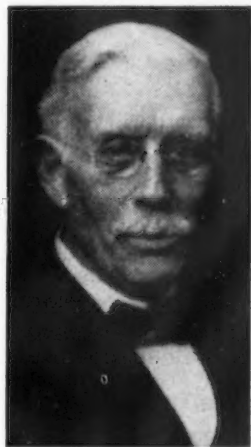
This new process produces a visible protective coating that is said materially to reduce the corrosion rate and prevents the formation of white corrosion products under many conditions where they would otherwise form on zinc or cadmium, and zinc or cadmium-coated metals. Patented by this company, its use is allowed only through license agreements.

The method of producing this film is extremely simple, involving a short immersion in a very inexpensive solution of sodium dichromate and sulphuric acid in water. The film gives the metal an appearance not unlike brass, with a greenish-brown iridescence. An immersion of from 5 to 10 sec. will produce a brown coating on zinc alloy die castings. A shorter immersion, from 1 to 5 sec., produces a lighter iridescent coating. Fortunately for industrial production practice, the color and its corresponding weight of coating is a direct indication of its protective value.

Certain difficulties encountered in zinc alloy die cast carburetors and automobile locks were attributed to the presence of white corrosion products. The Cronak process has been used very generally on these parts for over a year and has successfully removed the factor of white corrosion products and the possible causes of this difficulty.

OBITUARY

SAMUEL AUSTIN, founder and chairman of the board of the Austin Co., Cleveland industrial engineer and builder, died May 23 at his residence in Willoughby, Ohio, a Cleveland suburb, aged 85 years. Mr. Austin was a native of Orton, England, where he spent five years as a carpenter's apprentice. Coming to the United States in 1872



SAMUEL AUSTIN

with the intention of locating in Chicago, which was being rebuilt after its fire, he stopped off in Cleveland and decided to remain in that city, and the organization he founded expanded until it conducts operations in every State of the Union and in 21 foreign countries.

Widely known as an organization equipped to design, engineer and construct industrial plants from start to finish, the company has pioneered for several decades in standardized factory design. In 1899 Wilbert J. Austin, Samuel Austin's son, and now president of the Austin Co., was graduated from Case School of Applied Science, Cleveland, and with his knowledge of engineering and scientific construction, joined with his father in laying the foundations for an international construction organization which has designed and built more than 5000 plants.

Throughout his entire career Mr. Austin's interests were chiefly wrapped up in the affairs of the company and in the modernization and improvement of industrial building. Mr. Austin devoted much attention to community affairs and was one of the organizers of the Willoughby Community Fund and

honorary chairman of the Fund organization at the time of his death. He was also a leading member of the Willoughby Methodist Church. His chief recreation was traveling and during the past 20 years he made half a dozen trips to Europe and took a trip around the world.

♦ ♦ ♦

STEPHEN A. INGERSOLL, founder of the Ingersoll Steel & Disc Co., Chicago, died at his home in Galesburg, Ill., on May 15. Mr. Ingersoll was born in 1858 and at the age of 26 organized the Sandoval Mfg. Co., which was his start in the farm implement industry. The Sandoval plant was later moved to Galesburg, where the name of the company became the Galesburg Coulter-Disc Co. In 1916 the Indiana Rolling Mill Co. was acquired and the name of the combined companies was changed to Ingersoll Steel & Disc Co., which in turn became a division of the Borg-Warner Corp. at which time Mr. Ingersoll retired, leaving the company in charge of his son Roy C. Ingersoll.

♦ ♦ ♦

LEONARD BISHTON - BOTFIELD, since 1916 president of the Botfield Refractories Co., Philadelphia, died in that city on May



L. B. BOTFIELD

5, aged 55 years. He had been identified with the refractories industry for many years and was chairman of the high temperature bonding mortar division of the American Refractories Institute.

♦ ♦ ♦

ANDREW S. CRONK, director of purchases and member of the board of directors, Waukesha Motor Co., Waukesha, Wis., died May 20 at Columbia Hospital, Milwaukee, following a major operation. He was born in Waukesha in 1901 and became connected with the firm in 1919 in a minor capacity.

Power Transmission Group Reports Gains

THE benefits of group action in the power transmission industry were recognized by the members at the recent meeting of the Mechanical Power Engineering Associates and the Power Transmission Council in Atlantic City, N. J. The following resolution was unanimously adopted by both groups:

Whereas, the mechanical power transmission industry had failed to hold its competitive position and keep pace with the general industrial development of the country for years prior to the depression, and

Whereas, this loss of position was due both to the competition set up by manufacturers of small electrical motors and the lack of initiative on the part of the makers of mechanical power transmission in adapting their equipment to the needs of users and demonstrating the unquestionable economies to be realized by the use of their products when properly grouped and installed, and

Whereas, the work of the Mechanical Power Engineering Associates and of the Power Transmission Council has already resulted in fundamental economic gains through increased utility and important economies directly of benefit to the users of mechanical power transmission, and

Whereas, this work has so widely, obviously and quickly demonstrated to makers of power transmission equipment, to distributors, to engineers, and to users the genuine economic advantages to industrial America of the modern use of mechanical power transmission as to completely change the outlook and prospects of the mechanical power transmission industry, and has thereby re-established the confidence and hopes of its leaders and of the investors in it,

NOW THEREFORE, be it resolved that the members of the power transmission industry present at this joint meeting of the two organizations enthusiastically congratulate the leaders in the work and the members of the staff who together have achieved so much of such fundamental value and importance in so short a time; that they endorse the purpose of these organizations, that they approve and urge continuance of the program of practical, on-the-job aid to users in adapting mechanical power transmission to their needs and that they approve and urge continuance of the program of education and publicity, and

Be it further resolved, that this meeting call upon all members of the industry to inform themselves fully as to the work and to support it generously, not only as a direct means of assuring continued opportunities for the service and profit of their own companies but also as one of the most important investments they can make toward guaranteeing a more worthy and profitable future for one of America's most important industries.

PHILADELPHIA



... Philadelphia district mills advance prices \$2 a ton.

o o o

... Edward G. Budd Mfg. Co. awards over 500 tons of stainless strip and 65,000 tons of frame stock.

o o o

... Operations down one point to 44 per cent.

PHILADELPHIA, May 26. — Mills' promise sheets for deliveries are easing off, indicating that rolling backlogs are beginning to suffer from the current decline in consumer buying. Sellers here look for the average curve of bookings to continue a slow decline over the next 60 days, after which a rapid reversal and active demand for the year's end is anticipated.

With buying interest on the wane, it is only natural that price advances have the spotlight. The United States Steel Corp. has led off with \$2 increases for shapes, plates, sheet bars, forging and re-rolling billets. A revised differential list for forging billets is probable. Sheet mill products and merchant bars also have advanced \$2.

Evidently the Steel corporation's price action caught some mills unawares, to judge by their confusion. Practically all producers are hastily covering their regular customers with blanket contracts, and there is some doubt regarding the amount of steel which will actually be delivered during the third quarter at the \$2 advance. Some sellers are still openly dubious regarding the advisability of a mid-year price increase, and the belief persists that firm market prices by fourth quarter is the best to be expected.

Mill operations in Eastern Pennsylvania have undergone little change. Slight reductions in certain centers have dropped the district rate one point to 44 per cent of capacity, as compared with 32 per cent a year ago.

Pig Iron

Malleable foundries in this area are quite busy, and steel foundries are fairly active. Some jobbing

concerns are existing on day-to-day bookings, but others have quite a backlog. The average melt is considered comparatively satisfactory for this time of the year. Considerable iron is being sold to take care of this foundry activity, but there are many furnaces soliciting business and tonnages are necessarily spread pretty thin.

Plates and Shapes

Sun Shipbuilding & Dry Dock Co. has a sizable quantity of plates to place, and local shipbuilders will soon bid on a Government ocean-going dredge which will take 1000 tons. The two Matson Line boats, each taking 6000 tons of plates, shapes and bars, will be built by either the Newport News company or Moore Drydock Co. The latter bid \$2,445,438 for one single-screw boat, or \$2,341,836 for each of two. Bids of \$2,896,324 and \$2,782,534 for one and two double-screw boats were entered. On the same options, Newport News bid \$2,460,000, \$2,308,000, \$2,872,000 and \$2,705,000 respectively. Newport News gave a 14-month delivery date, which was several months better than that offered by Moore Drydock.

The market for shapes is currently confined to small lots, with little tonnage work in prospect. Belmont Iron Works will supply 110 tons for a Philadelphia school, McCloskey & Co. will soon award 700 tons for a junior high school, and over 3000 tons is still active for industrial buildings and State bridge work.

Strip

About the most attractive lot of business placed in this area for many years has definitely gone to Alan Wood Steel Co. This com-

pany will supply about 65,000 tons of Chevrolet frame stock, varying in width from 11 in. to 36 in. and 0.0625 in. to 0.25 in. thick, to Edward G. Budd Mfg. Co. for fabrication over the ensuing year. This tonnage was sold at current published price levels with provisions for quarterly adjustments in the advent of price changes. After several delays the Budd company has purchased over 500 tons of stainless steel strip for the construction of 56 Santa Fe cars. Sharon Steel Corp. and Republic Steel Corp. shared the bulk of this business, but a small percentage was spread in other directions. Most of this strip is 10 in. wide or less and varies in thickness from 0.010 in. to 0.125 in.

Sheets

Most of the larger consumers have contracted heavily against forward requirements; therefore, the forthcoming price rise may have little effect until well into the third quarter. Day-to-day miscellaneous demands for blue-annealed and hot-rolled sheets are none too encouraging. Cold-rolled grades are particularly quiet in the absence of buying on the part of autobody stamping plants. Dies for new models are being prepared, and new sheets sizes have not yet been determined. However, normal releases should start coming through by the middle of July.

Imports

The following iron and steel imports were received here last week: 1173 tons of pig iron from the Netherlands; 200 tons of pig iron, 100 tons of ferromanganese and 5 tons of drill steel from Norway; 5 tons of ferrochrome from Japan; 167 tons of structural shapes, 128 tons of steel bars and 71 tons of steel bands from Belgium, and 33 tons of structural shapes from France.



... Operations again increased.

o o

... Pig iron shipments gain over last month.

BUFFALO, May 26. — Buffalo steel mills have again increased operations this week. Bethlehem's Lackawanna plant is running 21 open-hearth; Republic Steel Corp. seven, and Wickwire-Spencer two.

Seneca sheet division of Bethlehem is at 85 per cent.

Merritt, Chapman & Scott Corp., New York, were awarded the first major contract for a section of intercepting sewer as part of the \$15,000,000 Buffalo sewage disposal plant system. Other divisions of the intercepting sewer system will be let in the near future.

Buffalo fabricators of structural steel and reinforcing bars are busy, but the orders are not sizeable.

Pig iron shipments show an improvement over last month, with furnaces beginning to move considerable canal boat iron. Blast furnace operation is the same.



... Demand for sheets is steady.

o o o

... Steel production unchanged.

CINCINNATI, May 26.—Sheet steel demand has reached a steady level at approximately 80 per cent of capacity. Automotive manufacturers, with new model developments in the offing, have reduced their requirements noticeably, but an upswing of stove and furniture demand tends to offset the slack in vehicle ordering. In fact, the leading interest indicates that stove and furniture buying has been about equal to automotive in recent years.

Jobbers' demand is slowly gathering momentum, but is not expected to reach the high level of 1935, when attractive price discounts stimulated heavy speculative purchasing. Rolling schedules are slightly better than demand, and backlogs are being rapidly dissolved.

Open-hearth operations are unchanged, 30 out of 39 being active. One interest took out one furnace the past week, but this was offset when another producer lighted an additional unit.

Pig iron ordering is slowly gathering momentum. Melters are buying slightly more material each week, but the strong market tone tends to retard spectacular coverages. Prices are being strictly followed and consumers find pressure

vain. The melt is unchanged at about 70 per cent of foundry operations.



K. & L. Oil Co., First National Bank Building, Oklahoma City, Okla., plans new 6-in. welded steel pipe line in Central Avenue, about 12,600 ft., for natural gas transmission. Cost close to \$30,000.

Tacoma, Wash., has low bid from Steel Pipe & Tank Co., 518 N.E. Columbia Boulevard, Portland, for 2500 ft. of 48-in., all-steel pipe for water supply line at \$86,219.

Equitable Gas Co., 435 Sixth Avenue, Pittsburgh, is arranging for purchase of steel pipe line system of C. L. Smith, Butler, Pa., in parts of Hampton, Ross and McCandless Townships, for natural gas distribution, and will construct line for connection with main system, where supply will be secured in future. Other extensions and improvements in acquired lines and distribution facilities will be made.

Charles E. Krebs, Inc., Boyce Building, Charleston, W. Va., engineer, will close bids early in July for new welded steel pipe line to be built by William T. Lively, Charleston, and associates, for natural gas service at Pineville and Middlesboro, Ky., including main line from natural gas field area, French Lick, Knox County, to first noted place, and second line from that point through Log Mountain district to Middlesboro, about 17 miles. Pipe line gathering system will be installed in gas fields mentioned, totaling about 26 miles, and distribution lines in two municipalities. Entire project will cost close to \$500,000.

Gulf Oil Co., Tulsa, Okla., plans new 6-in. welded steel pipe line to Altus, Okla., and vicinity, about 14 miles, for oil transmission. Cost over \$100,000.

Eason Oil Co., Enid, Okla., plans welded steel pipe line from oil refinery near Enid, to several points in Garfield County, totaling about 6000 ft., for oil transmission.



Chesapeake & Ohio has placed the following orders: 1800 50-ton coal cars with American Car & Foundry Co., Huntington, W. Va.; 2200 50-ton coal cars with Pullman-Standard Car Mfg. Co., Butler, Pa.; 500 50-ton coal cars and 500 50-ton box cars with Pullman-Standard Car Mfg. Co., Richmond, Va.; 500 50-ton box cars with General American Car Co., East Chicago, Ind.; 500 50-ton gondola cars with Bethlehem Steel Co., Johnstown, Pa.; 100 50-ton low-side gondola cars with Ralston Steel Car Co., Columbus, Ohio, and 150 50-ton automobile box cars with loading devices with Pullman-Standard Car Mfg. Co., Michigan City, Ind.

Pere Marquette has ordered 100 40-ton steel automobile-furniture cars, and 400 40-ton automobile cars with loading devices from Ralston Steel Car Co.

Norfolk & Western has ordered 500 hopper cars from Virginia Bridge Co., Roanoke, Va., and 500 hoppers from Pressed Steel Car Co., McKees Rocks, Pa.

St. Louis-Southwestern Railroad's application to spend \$1,933,203 will be heard in Federal court, St. Louis, June 19. Authority is sought to purchase five 4-8-4 type locomotives, 50 50-ft. automobile cars, 25 of which will have Evans loaders, five

air-conditioned coaches not to exceed \$45,000 each, and to equip 100 box cars with steel sides and auto doors, and trucks of flat cars with 50 steel underframes.

J. G. Brill Co., Philadelphia, has received orders for eight 39-passenger, two-motor trolley buses for Peoples Railway Co., Dayton, Ohio.

New York, New Haven & Hartford has purchased 10 locomotives from Baldwin Locomotive Works.

RAILS AND TRACK SUPPLIES

St. Louis-Southwestern has applied to the Federal Court for permission to buy 740 tons of 112-lb. rail with necessary tie plates and 100,000 rail anchors.

Cleveland Railway Co. has placed 1100 tons of girder rails with Carnegie-Illinois Steel Corp.



... May output in England likely to establish new record.

o o o

... New business quiet with increased prices expected after June 30.

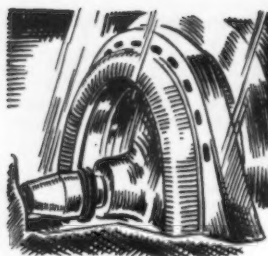
LONDON, May 25 (By Cable).—Output of foundry iron has been enlarged, but owing to heavy arrears, makers are unable to consider fresh bookings. Official confirmation is expected of the 5s. premium now being asked for deliveries after June 30.

Steel activity is being maintained and May output will likely establish a new record, possibly exceeding a million tons. New business is quiet as higher prices are expected after June 30, but a big volume of orders is likely to be released as soon as price question is settled. Makers of bars and billets cannot handle more orders while heavy steel is being actively specified by shipyards, engineering and building trades. The admiralty has ordered nine destroyers. Plate and sheet mills are inadequately employed owing to lack of export orders.

Tin plate business is quiet pending the outcome of the Paris meeting of the International Tin Plate Cartel last Friday which discussed quota and price adjustments, but reached no conclusive settlement. German works are securing a large Continental business by quoting below agreed prices.

Continental iron and steel market remains dull.

The recent international cartel meeting discussed the formation of an international thin sheet cartel, but made no decision.



NON-FERROUS

... *Healthy consumption of copper offsets weak buying.*

o o o

... *Lead shipments in April exceeded 40,000 tons; stocks reduced.*

o o o

... *Buying spree in tin suffers relapse as international committee disagrees.*

NEW YORK, May 26.—Buying of domestic copper continues dull, with sales over the week-end of but 459 tons and yesterday of 578 tons. The month's total to date of 13,034 tons is small in the extreme. When viewed, however, in the light of recent events, the present situation is understandable and reflects no disparagement upon the market's strength. The fact that a brisk rate of consumption keeps shipments moving along in volume tends to offset the disadvantages of limited buying. The price tone, therefore, is firm at 9.50c. a lb., and indications point to no immediate change. Export demand has recently been easier, but appears now to have recovered enough to assist prices in regaining lost ground. Today's foreign equivalent for electrolytic is 9.10c. a lb., as against a recent low of 9.00c. a lb. Such demand as currently exists among home consumers is restricted to purchases by company-owned fabricators.

Lead

Preliminary estimates that shipments of lead in April would reach 40,000 tons have been confirmed by release of official statistics. The total was 40,457 tons, an increase of 3714 tons over March when 36,743 tons was moved. Total refined production, as between the two months, expanded 2923 tons to 38,073 tons, March output having been 35,150 tons. At the end of April stocks stood at 220,991 tons, a decline of 2397 tons from the 223,388 tons extant at the period's opening.

The market for lead is satisfactory, with day-to-day sales in moderate volume, practically unchanged from a week ago. Orders for April

shipment are still coming in, though on a small-lot basis. June is stated to be about 60 per cent

covered. Demand affecting sales of the leading producer appears to have picked up slightly since the week opened, but other interests report no rising trend from a week ago. Prices, however, are steady in all directions, and it is felt that prospects for continued good consumption will support quotations without difficulty. On some of its brands sold in the East, St. Joseph Lead Co. continues to secure a \$1 a ton premium over the regular New York market quotation of 4.60c. a lb.

Tin

Prior to yesterday, the tin market was a quiet affair, with little or no buying interest evident, but commencing Monday the situation abruptly changed and buyers came into the market for quite large tonnages. Tin plate interests were outstanding. Today the reverse has occurred, and the market is again inactive. Sellers see a possible link between this happening and the outcome of the Interna-

The Week's Prices. Cents Per Pound for Early Delivery

	May 20	May 21	May 22	May 23	May 25	May 26
Electrolytic copper, Conn.*.....	9.50	9.50	9.50	9.50	9.50	9.50
Lake copper, N. Y.....	9.62 1/2	9.62 1/2	9.62 1/2	9.62 1/2	9.62 1/2	9.62 1/2
Straits tin, Spot, New York.....	45.87 1/2	45.87 1/2	45.80	45.80	45.75	46.00
Zinc, East St. Louis.....	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York†.....	5.27 1/2	5.27 1/2	5.27 1/2	5.27 1/2	5.27 1/2	5.27 1/2
Lead, St. Louis.....	4.45	4.45	4.45	4.45	4.45	4.45
Lead, New York.....	4.60	4.60	4.60	4.60	4.60	4.60

*Delivered Connecticut Valley; price 1/4c. lower delivered in New York.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-21.00c. a lb., delivered.

Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.

Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.

Antimony, Asiatic, 13.50c. a lb., New York.

Quicksilver, \$75.00 to \$76.00 per flask.

Brass ingots, commercial 85-5-5-5, 9.25c. a lb., delivered; in Middle West 1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.....	47.00c. to 48.00c.
Tin, bar.....	49.00c. to 50.00c.
Copper, Lake.....	10.25c. to 11.25c.
Copper, electrolytic.....	10.25c. to 11.25c.
Copper, castings.....	10.00c. to 11.00c.

*Copper sheets, hot-rolled..... 17.00c.

*High brass sheets..... 15.12 1/2c.

*Seamless brass tubes..... 17.37 1/2c.

*Seamless copper tubes..... 17.50c.

*Brass rods..... 13.12 1/2c.

Zinc, slabs..... 5.75c. to 6.75c.

Zinc, sheets (No. 9), casks, 1200 lb. and over..... 10.25c.

Lead, American pig..... 5.10c. to 6.10c.

Lead, bar..... 6.10c. to 7.10c.

Lead, Sheets, cut..... 8.25c.

Antimony, Asiatic..... 14.00c. to 15.00c.

Alum., virgin, 99 per cent plus..... 23.30c.

Alum., No. 1 for remelting, 98 to 99 per cent..... 18.50c. to 20.00c.

Solder, 1/2 and 1/2..... 29.50c. to 30.50c.

Babbitt metal, commercial grades..... 25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig..... 50.25c.

Tin, bar..... 52.25c.

Copper, Lake..... 10.25c. to 10.50c.

Copper, electrolytic..... 10.25c. to 10.50c.

Copper, castings..... 10.00c. to 10.25c.

Zinc, slabs..... 6.50c. to 6.75c.

Lead, American pig..... 5.20c. to 6.50c.

Lead, bar..... 8.50c.

Antimony, Asiatic..... 15.00c.

Babbitt metal, medium grade..... 19.00c.

Babbitt metal, high grade..... 54.25c.

Solder, 1/2 and 1/2..... 27.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	7.37 1/2c.	8.12 1/2c.
Copper, hvy. and wire.....	7.25c.	7.75c.
Copper, light and bottoms.....	6.25c.	6.75c.
Brass, heavy.....	4.12 1/2c.	4.75c.
Brass, light.....	3.37 1/2c.	4.12 1/2c.
Hvy. machine composition.....	6.12 1/2c.	6.62 1/2c.
No. 1 yel. brass turnings.....	5.12 1/2c.	5.62 1/2c.
No. 1 red brass or compos. turnings.....	5.75c.	6.25c.
Lead, heavy.....	3.62 1/2c.	4.00c.
Sheet aluminum.....	13.25c.	14.75c.
Zinc.....	2.50c.	2.87 1/2c.
Cast aluminum.....	12.12 1/2c.	13.25c.

tional Committee's meeting which took place today. Cable advices state that the meeting disbanded due to disagreement, and that no decision on quotas will be forthcoming for another month. Meanwhile tin prices at New York have rallied a bit, with spot Straits metal quotable today at 46.00c. a lb., as against a price of 45.75c. yesterday and 45.90c. a week ago. The morning's London quotation on standard metal was £201 5s cash, and £196 5s, three months. The Eastern price was £201 5s.

Zinc

A further substantial reduction in unshipped tonnage has occurred, and these orders are accordingly down to 28,132 tons. The week's sales of Prime Western were 1971 tons, while shipments were 4984 tons. While, at the moment, there are no indications of a heavier volume of buying, it would seem plausible to suggest that the trade's customers ought to give their attention to some replacement purchasing before long. Just how effective a restraint upon domestic activity the unfavorable foreign price is having should be put to test provided easiness lasts in that direction and unfilled domestic orders persist in their present trend. The price for zinc is reported firm and unchanged at 4.90c. a lb., East St. Louis.

Ingot Brass and Bronze

The Non-Ferrous Ingot Metal Institute reports the average prices per lb. received by its membership on commercial 80-10-10 and commercial 85-5-5-5 brass ingots, during 28 days ended May 15, were 10.944c. and 9.320c. respectively. Preceding prices were 10.815c. and 9.278c. Combined deliveries of brass and bronze ingots in April by members of the Institute totaled 6012 tons. Unfilled orders at the month's close amounted to 22,238 tons.

A new edging brush for black edging white porcelain enamel ware has been brought out by the Ferro Enamel Corp., Cleveland. This brush has a set of movable metal guides which permit the adjustment of the brushing surface to the width of the edging desired as the bristles of the brush wear down in use. The brush, which is patented, is being offered in complete line of sizes.

Cutler-Hammer, Inc., Twelfth and St. Paul Avenue, Milwaukee, has opened new office at 10 West Chase Street, Baltimore, which will be under supervision of Philadelphia office. R. A. Haworth will be in charge.



... Awards of 5760 tons —1430 tons in new projects.

AWARDS

Boston, 100 tons, Baptist Hospital addition, to Concrete Steel Co.

Chicago, 260 tons, north side sewage treating plant, to Concrete Engineering Co.

State of Illinois, 100 tons, road work, to Concrete Engineering Co.

State of Wisconsin, 200 tons, road work, to Concrete Steel Co.

Waukesha, Wis., 150 tons, high school addition, to W. H. Pipkorn Co., Milwaukee.

Tempe, Ariz., 100 tons, stadium and arts building at State Teachers College, to an unnamed bidder.

Los Angeles, 105 tons, John Marshall high school, to Security Materials Co.

Los Angeles, 190 tons, Ramona school, to Concrete Engineering Co.

Los Angeles, 1400 tons, Macy Street subway, to Blue Diamond Corp.

Los Angeles, 475 tons, United Parcels Service warehouse and garage, to Consolidated Steel Corp.

Los Angeles, 100 tons, building at Holy Spirit parochial school, to Blue Diamond Corp.

Los Angeles, 400 tons reinforced mesh, for Metropolitan Water District, to Pittsburgh-Des Moines Steel Co.

Los Angeles, 120 tons, addition to Sears Roebuck & Co. store, to Concrete Engineering Co.

Los Angeles, 200 tons, property building for Twentieth Century-Fox Film Corp., to Truscon Steel Co.

Los Angeles, 390 tons, for Treasury Department, Schedule No. 10483, to Los Angeles Iron & Steel Co.

Los Angeles, 125 tons, addition to North Hollywood high school, to Concrete Engineering Co.

Los Angeles, 100 tons, alterations on Alexandria school, to Securities Material Co.

San Pedro, Cal., 100 tons, high school, to Blue Diamond Corp.

Oakland, Cal., 420 tons, State undercrossing at San Leandro Street, to Soule Steel Co.

Fullerton, Cal., 150 tons, school, to Blue Diamond Corp.

Westwood, Cal., 200 tons, administration building for University of California at Los Angeles, to Consolidated Steel Corp.

Camarillo, Cal., 125 tons, two ward buildings at State hospital, to Soule Steel Co.

Oceanside, Cal., 100 tons, State bridge over Santa Margarita River, to Soule Steel Co.

Pasadena, Cal., 150 tons, Community Play House Association school, to Consolidated Steel Corp.

NEW REINFORCING BAR PROJECTS

Philadelphia, 700 tons, junior high school; McCloskey & Co. low bidder.

Batavia, Ill., 200 tons, Campana plant.

State of Illinois, 400 tons, highway projects; bids May 29.

Milwaukee, 500 tons, elevator and malt house additions for D. D. Weschler & Sons, Inc.; bids in.

State of Wyoming, 130 tons, bridges in three counties; bids May 28.

Sacramento, Cal., 100 tons, State overhead crossing at Jibboom Street; bids advanced to June 10.

Bakersfield, Cal., 100 tons, Union high school; general contract awarded.



Meetings in June

May 31 to June 5. Society of Automotive Engineers. Summer meeting. Greenbrier, White Sulphur Springs, W. Va. John A. C. Warner, 29 West Thirty-Ninth Street, New York, general manager.

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June 1 to 4. American Electro-Platers' Society. Annual convention. Hotel Carter, Cleveland. E. Steen Thompson, 905 West Tenth Street, Erie, Pa., secretary.

o o o

June 1 to 3. Scientific Apparatus Makers of America. Annual convention. Edgewater Beach Hotel, Chicago. J. M. Robert, 20 North Wacker Drive, Chicago, secretary.

o o o

June 4 to 6. Midwest Welding Conference. Conference and exhibition, 2211 West Pershing Road, Chicago. O. L. Howland, 3357 West Forty-Seventh Place, Chicago.

o o o

June 5 and 6. Electric Metal Makers Guild. Annual meeting. Hotel Onesto, Canton, Ohio. J. H. Chivers, 1051 Woodberry Road, New Kensington, Pa., secretary-treasurer.

o o o

June 10 to 12. American Steel Warehouse Association, Inc. Edgewater Beach Hotel, Chicago. Walter S. Dosey, Terminal Tower Building, Cleveland, executive secretary.

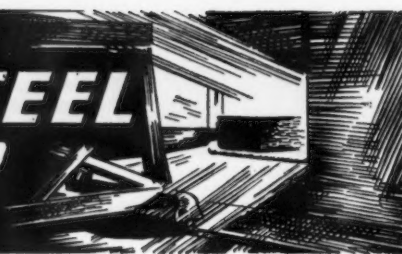
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June 15 to 20. American Society of Mechanical Engineers. Semi-annual meeting. Hotel Adolphus, Dallas. C. E. Davies, 29 West Thirty-Ninth Street, New York, secretary.

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June 29 to July 3. American Society for Testing Materials. Chalfonte-Haddon Hall, Atlantic City, N. J. C. L. Warwick, 260 South Broad Street, Philadelphia.

IRON AND STEEL SCRAP



... Scrap composite down 17c. to \$13.08 a gross ton.

• • •

... Consumer buying continues to lag.

• • •

... Sellers believe serious market weakness is over.

MAY 26.—Several price adjustments in the eastern Pennsylvania area have forced the composite price down to \$13.08, which establishes a new low point for the year. Major consuming districts continue to show very little activity. Nevertheless, sellers are more prone to hold their accumulations for a price rather than dump them on the market at any figure. The most optimistic, however, do not look for much market snap until early July, at which time scrap prices are expected to swing upward in anticipation of expanding mill operations.

Pittsburgh

The market here is unchanged, and no sales have been reported for several weeks. Some dealers feel that a sale will be made in a week or so. However, one large consumer is expected to remain out of the market for quite some time. Apparently both buyers and sellers are awaiting the outcome of pending railroad selling, which will in some measure tend to define the market more clearly.

Chicago

Although consumer interest in new supplies is lacking, demand under contract continues heavy. Increased consumption is expected next month, for the prospect of a broader scale of steel operations carries the possibility of some new business in that period. More than 100 cars of heavy melting steel are being offered by two railroads in this district this week, but in view of the steady contract demand, the present price of \$12.50 to \$13 should not be disturbed.

Philadelphia

This buyers' market continues to be listless and featureless. No sales of any moment have been made, mills continue to draw on old contracts to take care of current needs or build up stock reserves, and the outlook is not particularly encouraging for sellers. It is not unlikely that the market must worry through June and well into July before it regains any of its usual snap. Nos. 1 and 2 steels have been marked down 50c. on sentiment alone, and new and old bundles are quotably lower in sympathy. Foundry and rolling mill grades are for the most part untested and nominal. Brokers are able to take their pick of No. 1 shipments to Port Richmond at \$11. A \$10 price is being offered for No. 2, mostly to establish a market rather than secure export tonnage.

Cleveland

A Cleveland consumer has purchased a few thousand tons of blast furnace scrap at \$8.50. Dealers are paying up to the same price to fill outstanding orders, some of which were taken at a higher price. A Youngstown district mill which recently bought considerable scrap made some additional purchases the past week. Local prices are steady and unchanged with the exception of an advance in the minimum quotation on blast furnace grades.

Buffalo

The largest consuming interest will buy No. 1 steel at \$13 for large lots and \$12.50 for smaller lots. This is the only buying interest being shown, other purchasers apparently holding off for further drops in the market or for the freer movement of barge scrap.

Detroit

Moderate buying in Youngstown and Pittsburgh has tended to stabilize prices here. It was inevitable that steel mills enter the market, and this concerted action has brought about a price turn after several weekly declines.

Cincinnati

Dealers in old materials again are forecasting a buoyant fourth quarter despite a quiet and somewhat weaker current market. There is a feeling that mill buying is now actually in the offing, and an improvement in prices is prophesied. In the meantime, however, quotations on several major items have been adjusted downward in keeping with past weakness.

St. Louis

Buyers are showing no interest in new orders, and the market continues to be weak. Cast iron borings and turnings are 50c. lower, and rails for rolling are 25c. off, as compared with last week. Offerings are light, which gives dealers the impression that the market has about reached bottom.

New York

The market here continues to be quiet. Dealers expect prices to remain at present levels for several weeks and then to show signs of strengthening. Foreign buyers, however, anticipate additional price weakness and consequently are delaying the placement of new business. Several attractive lots of turnings and steel scrap will be bid in June 15 at the Naval Torpedo Station, Newport, R. I.

Boston

Brokers are paying \$3.40 a ton for steel turnings, or 50c. less than heretofore for Weirton delivery. For the same point, bushelling and bundled skeleton is up about 20c. to \$6.50. Otherwise, prices are unaltered. The Phillipsdale, R. I., mill is buying heavy cast at \$10 a ton, delivered. No. 1 and No. 2 steel for export are moderately active, and prices are unchanged.

Continental Iron & Steel Co. has moved its Pittsburgh office to the Keenan Building, continuing under the supervision of Harvey D. Stalnaker, district manager.

General Refractories Co., 106 South Sixteenth Street, Philadelphia, has appointed E. Corey & Co., Portland, Me., as dealer agent in that area.

Union Drawn Steel Co., Massillon, Ohio, has moved Dayton office to larger quarters at 621 Mutual Home Building. Ralph Hering will be in charge.

Link-Belt Co., Chicago, has appointed Industrial Supplies, Inc., Poplar Avenue and River Front, Memphis, as authorized distributors.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	12.50 to 13.00
No. 2 RR. wrought.	14.00 to 14.50
Scrap rails	14.75 to 15.25
Rails, 3 ft. and under.	16.50 to 17.00
Comp. sheet steel	14.00 to 14.50
Hand bundled sheets.	12.00 to 13.00
Hvy. steel axle turn.	12.50 to 13.00
Machine shop turn.	9.50 to 10.00
Short shov. turn.	8.75 to 10.25
Mixed bor. turn.	8.25 to 9.25
Cast iron borings.	10.00 to 10.50
Cast iron carwheels.	14.00 to 14.50
Hvy. breakable cast.	13.00 to 13.50
No. 1 cast	15.00 to 15.50
RR. knuckles & cplrs.	16.75 to 17.25
Rail, coil & leaf springs	16.75 to 17.25
Rolled steel wheels.	17.00 to 17.50
Low phos. billet crops	17.50 to 18.00
Low phos. sh. bar.	17.00 to 17.50
Low phos. punchings.	16.75 to 17.25
Low phos. plate scrap.	16.75 to 17.25
Steel car axles	16.00 to 16.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 hvy. mltng. steel.	\$13.25 to \$13.75
No. 2 hvy. mltng. steel.	12.00 to 12.50
Comp. sheet steel	12.50 to 13.00
Light bund. stampings	9.00 to 9.50
Drop forge flashings.	12.00 to 12.50
Machine shop turn.	7.50 to 8.00
Short shov. turn.	8.00 to 8.50
No. 1 busheling	12.50 to 13.00
Steel axle turnings.	12.50 to 12.50
Low phos. billet crops	17.00 to 17.50
Cast iron borings.	8.25 to 8.50
Mixed bor. & turn.	8.25 to 8.50
No. 2 busheling	8.25 to 8.50
No. 1 cast	14.50 to 15.00
Railroad grate bars.	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.00 to 17.50
Rails for rolling	16.50 to 17.00
Railroad malleable	17.00 to 17.50
Cast iron carwheels.	15.50

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 hvy. mltng. steel.	\$12.00 to \$12.50
No. 2 hvy. mltng. steel	11.00 to 11.50
Hydraulic bund., new.	12.00 to 12.50
Hydraulic bund., old.	9.00 to 9.50
Steel rails for rolling.	15.00 to 15.50
Cast iron carwheels.	13.50 to 14.00
Hvy. breakable cast.	13.00 to 13.50
No. 1 cast	13.50 to 14.00
Stove plate (steel wks.)	10.50 to 11.00
Railroad malleable	17.00 to 17.50
Machine shop turn.	8.00 to 8.50
No. 1 blast furnace.	6.25
Cast borings	6.00
Heavy axle turnings.	11.00 to 11.50
No. 1 low phos. hvy.	16.00 to 16.50
Couplers & knuckles.	16.00 to 16.50
Rolled steel wheels.	16.00 to 16.50
Steel axles	16.00 to 16.50
Shafting	18.50 to 19.00
No. 1 RR. wrought.	14.50 to 15.00
Spec. iron & steel pipe	12.00 to 12.50
Bundled sheets	12.50 to 13.50
No. 1 forge fire	12.50 to 13.50
Cast borings (chem.)	10.50 to 13.00

CHICAGO

Delivered Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel.	\$12.50 to \$13.00
Auto. hvy. mltng. steel	11.00 to 11.50
Shovelling steel	12.50 to 13.00
Hydraul. comp. sheets.	11.50 to 12.00
Drop forge flashings.	12.00 to 12.50
No. 1 busheling	11.50 to 12.00
Rolled carwheels	14.00 to 14.50
Railroad tires cut	14.00 to 14.50
Railroad leaf springs.	14.00 to 14.50
Axle turnings	12.00 to 12.50
Steel coup. & knuckles	14.00 to 14.50
Coil springs	14.50 to 15.00
Axle turn. (elec.)	12.75 to 13.25
Low phos. punchings.	14.50 to 15.00
Low phos. plates, 12 in. and under	15.00 to 15.50
Cast iron borings	6.00 to 6.50
Short shov. turnings.	6.25 to 6.75
Machine shop turn.	5.50 to 6.00
Rerolling rails	14.00 to 14.50
Steel rails under 3 ft.	14.75 to 15.25
Steel rails under 2 ft.	15.25 to 15.75
Angle bars, steel	14.50 to 15.00
Cast iron carwheels	13.50 to 14.00
Railroad malleable	15.50 to 16.00
Agric. malleable	13.50 to 14.00
Per Net Ton	
Iron car axles	\$17.50 to \$18.00
Steel car axles	14.25 to 14.75
No. 1 RR. wrought.	11.50 to 12.00
No. 2 RR. wrought.	11.00 to 11.50

No. 2 busheling, old.	\$7.50 to \$8.00
Locomotive tires	12.00 to 12.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast	11.00 to 11.50
No. 1 railroad cast.	11.00 to 11.50
No. 1 agric. cast.	10.00 to 10.50
Stove plate	7.00 to 7.50
Grate bars	8.50 to 9.00
Brake shoes	8.50 to 9.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel.	\$12.50 to \$13.00
No. 2 hvy. mltng. steel.	11.00 to 11.50
Scrap rails	12.00 to 12.50
New hy. b'ndled sheets	11.00 to 11.50
Old hydraul. bundles.	10.00 to 10.50
Drop forge flashings.	11.00 to 11.50
No. 1 busheling	11.00 to 11.50
Hvy. axle turnings.	11.50 to 12.00
Machine shop turn.	6.50 to 7.00
Knuckles & couplers.	15.50 to 16.00
Coil & leaf springs.	15.50 to 16.00
Rolled steel wheels.	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Short shov. turnings.	7.75 to 8.25
Mixed bor. & turn.	7.75 to 8.25
Cast iron borings.	7.75 to 8.25
No. 2 bushelings	6.50
Steel car axles	13.50 to 14.00
Iron axles	12.00 to 12.50
No. 1 machinery cast.	13.00 to 13.50
No. 1 cupola cast.	12.00 to 12.50
Stove plate	10.50 to 11.00
Steel rails, under 3 ft.	15.75 to 16.25
Cast iron carwheels.	11.50 to 12.00
Railroad malleable	16.25 to 16.75
Chemical borings	9.00 to 9.50

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Hvy. melting steel.	\$11.00 to \$11.50
Scrap steel rails.	11.50 to 12.00
Short shov. turnings.	7.00
Stove plates	8.00
Steel axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 RR. wrought.	8.50 to 9.00
Rails for rolling	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Tramcar wheels	11.00 to 12.00

ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:	
Selected hvy. steel.	\$12.00 to \$12.50
No. 1 hvy. melting	12.00 to 12.50
No. 2 hvy. melting	10.00 to 10.50
No. 1 locomotive tires.	11.00 to 11.50
Misc. stand-sec. rails.	12.50 to 13.00
Railroad springs	13.50 to 14.00
Bundled sheets	9.50 to 10.00
No. 2 RR. wrought.	12.00 to 12.50
No. 1 busheling	7.50 to 8.00
Cast bor. & turn.	4.00 to 4.50
Rails for rolling	13.50 to 14.00
Machine shop turn.	4.00 to 4.50
Heavy turnings	9.25 to 9.75
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
No. 1 RR. wrought.	10.50 to 11.00
Steel rails under 3 ft.	13.50 to 14.00
Steel angle bars	12.75 to 13.25
Cast iron carwheels.	11.00 to 11.50
No. 1 machinery cast.	11.00 to 11.50
Railroad malleable	13.50 to 14.00
No. 1 railroad cast.	11.00 to 11.50
Stove plate	7.50 to 8.00
Agricul. malleable	12.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$10.00 to \$10.50
No. 2 hvy. mltng. steel.	8.00 to 8.50
Scrap rails for mltng.	10.50 to 11.00
Loose sheet clippings.	5.75 to 6.25
Bundled sheets	7.75 to 8.25
Cast iron borings	5.00 to 5.50
Machine shop turn.	5.75 to 6.25
No. 1 busheling	8.50 to 9.00
No. 2 busheling	4.25 to 4.75
Rails for rolling	11.00 to 11.50
No. 1 locomotive tires	9.50 to 10.00
Short rails	14.00 to 14.50
Cast iron carwheels	10.50 to 11.00
No. 1 machinery cast.	11.50 to 12.00
No. 1 railroad cast.	10.75 to 11.25
Burnt cast	7.75 to 8.25
Stove plates	7.75 to 8.25
Agricul. malleable	9.75 to 10.25
Railroad malleable	11.50 to 12.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$9.50 to \$10.00
No. 2 hvy. mltng. steel.	8.50 to 9.00
Borings and turnings.	5.50 to 6.00
Long turnings	5.25 to 5.75
Short shov. turnings.	5.75 to 6.25
No. 1 machinery cast.	14.50 to 15.00

Automotive cast	\$12.25 to \$12.75
Hydraul. comp. sheets	9.50 to 10.00
Stove plate	8.75 to 9.25
New factory bushel.	9.00 to 9.50
Old No. 2 busheling.	5.00 to 5.50
Sheet clippings	7.00 to 7.50
Flashings	8.50 to 9.00
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Mon-treal
Hvy. melting steel.	\$7.50	\$7.00
Rails, scrap	8.50	8.00
Machine shop turn.	4.00	4.00
Boiler plate	7.00	6.00
Hvy. axle turnings.	4.50	4.00
Cast borings	5.00	4.50
Steel borings	4.00	4.00
Wrought pipe	4.00	4.00
Steel axles	8.50	9.00
Axles, wrought iron.	9.00	9.50
No. 1 machinery cast.	11.50	11.00
Stove plate	7.50	7.00
Standard carwheels	11.00	10.50
Malleable	7.00	7.00
Shovelling steel	6.50	6.00
Bushelings	6.00	5.50
Compressed sheets	6.50	6.00

YOUNGSTOWN

Per gross ton delivered consumers' yards:	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
Hydraulic bundles	14.50 to 15.00
Machine shop turn.	10.00 to 10.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$8.75 to \$9.25
No. 2 hvy. mltng. steel.	7.50 to 8.00
Hvy. breakable cast.	8.00 to 8.50
No. 1 machinery cast.	9.00 to 9.50
No. 2 cast	7.75 to 8.25
Stove plate	6.75 to 7.25
Steel car axles	13.00 to 13.50
Shafting	14.00 to 14.50
No. 1 RR. wrought.	9.00 to 9.50
No. 1 wrought long.	8.50 to 9.00
Spec. iron & steel pipe	8.50 to 9.00
Forge fire	7.50 to 8.00
Rails for rolling	10.50 to 11.00
Short shov. turnings.	5.00 to 5.50
Machine shop turn.	4.50 to 5.00
Cast borings	4.50 to 5.00
No. 1 blast furnace.	3.00 to 3.50
Cast borings (chem.)	9.50 to 10.50
Unprepar. yard scrap.	5.00 to 5.50

Per gross ton, delivered local foundries:
 No. 1 machin. cast. \$11.50
 No. 1 hvy. cast cupola. 9.50
 No. 2 cast 8.00
 Add 50c. to 75c. to above quotations to secure North Jersey prices.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	\$9.15 to \$9.40
Scrap rails	9.15 to 9.40
No. 2 steel	8.50 to 8.75
Breakable cast	8.00 to 8.25
Machine shop turn.	3.40 to 3.65
Bund. skeleton, long	6.50
Shafting	13.50 to 13.75
Cast bor., chemical.	5.00 to 7.00
Cotton ties	5.75 to 6.00
Per gross ton delivered consumers' yards:	
Textile cast	\$10.50 to \$11.00
No. 1 machin. cast.	10.50 to 11.00
Stove plate	9.00

EXPORT

Brokers' buying prices per gross ton:

New York, delivered alongside barges	
No. 1 hvy. mltng. steel.	\$9.50
No. 2 hvy. mltng. steel.	8.50
No. 2 cast	\$8.00 to 8.50
Stove plate	7.00 to 7.25
Rails (scrap)	10.50 to 11.00

Philadelphia, on cars at

Port Richmond	
No. 1 heavy melting steel.	\$11.00
No. 2 heavy melting steel.	10.00

Boston, on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$10.50
No. 2 hvy. mltng. steel.	9.50
Rails (scrap)	\$10.50 to 11.00
Machine shop turn.	5.25 to 5.75
Stove plate	7.25 to 7.50

New Orleans, on cars at

Suyvesant Dock	
No. 1 hvy. mltng. steel.	\$10.00 to \$10.50
No. 2 hvy. mltng. steel.	9.00 to 9.50

Los Angeles, on cars or trucks

at local piers	
No. 1 hvy. mltng. steel.	\$10.25 to \$10.75
Compressed bundles	8.50 to 8.75

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton
Rerolling\$28.00
Forging quality 35.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open-hearth or Bessemer\$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared 1.80c.

Wire Rods

(Nos. 4 and 5)

Per Gross Ton
F.o.b. Pittsburgh or Cleveland.\$38.00
F.o.b. Chicago, Youngstown or Anderson, Ind. 39.00
F.o.b. Worcester, Mass. 40.00
F.o.b. Birmingham 41.00
F.o.b. San Francisco 47.00
F.o.b. Galveston 44.00

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.
F.o.b. Pittsburgh1.85c.
F.o.b. Chicago or Gary.....1.90c.
F.o.b. Duluth2.00c.
Del'd Detroit2.00c.
F.o.b. Cleveland1.90c.
F.o.b. Buffalo1.95c.
Del'd Philadelphia2.16c.
Del'd New York2.20c.
F.o.b. Birmingham2.00c.
F.o.b. cars dock Gulf ports...2.25c.
F.o.b. cars Pacific ports.....2.40c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh1.70c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.1.75c.
F.o.b. Buffalo1.80c.
F.o.b. Birmingham1.85c.
F.o.b. cars dock Gulf ports...2.10c.
F.o.b. cars dock Pacific ports..2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh2.05c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham2.10c.
Del'd Detroit2.20c.
F.o.b. cars dock Gulf ports...2.45c.
F.o.b. cars dock Pacific ports..2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh1.90c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham1.95c.
F.o.b. cars dock Gulf ports...2.30c.
F.o.b. cars dock Pacific ports..2.30c.

Iron

F.o.b. Chicago1.80c.
F.o.b. Pittsburgh (refined)....2.10c.
Delivered New York2.05c.
Delivered Philadelphia2.10c.

Cold Finished Bars and Shafting*

Base per Lb.
F.o.b. Pittsburgh2.10c.
F.o.b. Cleveland, Chicago and Gary2.15c.
F.o.b. Buffalo2.20c.
Del'd Detroit2.30c.
Del'd eastern Michigan.....2.35c.

*In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.

F.o.b. Pittsburgh1.80c.
F.o.b. Chicago or Gary1.85c.
Del'd Cleveland1.95c.
F.o.b. Coatesville or Spar. Pt.1.90c.
Del'd Philadelphia1.99c.
Del'd New York2.09c.
F.o.b. Birmingham1.95c.
F.o.b. cars dock Gulf ports...2.20c.
F.o.b. cars dock Pacific ports..2.35c.
Wrought iron plates, f.o.b. Pittsburgh3.20c.

Floor Plates

F.o.b. Pittsburgh3.35c.
F.o.b. Chicago3.40c.
F.o.b. Coatesville3.45c.
F.o.b. cars dock Gulf ports...3.75c.
F.o.b. cars dock Pacific ports..3.90c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh1.80c.
F.o.b. Chicago1.85c.
Del'd Cleveland1.95c.
F.o.b. Buffalo or Bethlehem...1.90c.
Del'd Philadelphia2.015c.
Del'd New York2.0625c.
F.o.b. Birmingham (standard)1.95c.
F.o.b. cars dock Gulf ports ...2.20c.
F.o.b. cars dock Pacific ports..2.35c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh2.15c.
F.o.b. Chicago or Buffalo.....2.25c.
F.o.b. cars dock Gulf or Pacific Coast ports2.60c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb. per gross ton.....\$36.37½
Angle bars, per 100 lb. 2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton\$35.00
Light rails (from rail steel) per gross ton 34.00

Base per 100 Lb.

Spikes 2.60
Tie plates, steel 1.90
Tie plates, Pacific Coast ports.. 2.00
Track bolts, to steam railroads.. 3.60
Track bolts, to jobbers, all sizes (per 100 counts) 70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE,

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.
No. 10, f.o.b. Pittsburgh1.85c.
No. 10, f.o.b. Gary1.95c.
No. 10, del'd Detroit2.05c.
No. 10, del'd Philadelphia2.16c.
No. 10, f.o.b. Birmingham2.00c.
No. 10, f.o.b. cars dock Pacific ports2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh2.40c.
No. 24, f.o.b. Gary2.50c.
No. 24, del'd Detroit2.45c. to 2.60c.
No. 24, del'd Philadelphia2.71c.

No. 24, f.o.b. Birmingham.....2.55c.
No. 24, f.o.b. cars dock Pacific ports3.05c.
No. 24, wrought iron, Pittsburgh4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh...2.50c.
No. 10 gage, f.o.b. Gary2.60c.
No. 10 gage, f.o.b. Detroit.....2.70c.
No. 10 gage, del'd Philadelphia..2.81c.
No. 10 gage, f.o.b. Birmingham..2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh..2.95c.
No. 20 gage, f.o.b. Gary3.05c.
No. 20 gage, del'd Detroit.....3.15c.
No. 20 gage, del'd Philadelphia..3.26c.
No. 20 gage, f.o.b. Birmingham..3.10c.
No. 20 f.o.b. cars dock Pacific ports3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh...3.10c.
No. 24, f.o.b. Gary3.20c.
No. 24, del'd Philadelphia3.41c.
No. 24, f.o.b. Birmingham3.25c.
No. 24, f.o.b. cars dock Pacific ports3.70c.
No. 24, wrought iron, Pittsburgh4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh3.40c.
F.o.b. Gary3.50c.
F.o.b. cars dock Pacific ports..4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh2.95c.
No. 20, f.o.b. Gary3.05c.
No. 20, f.o.b. Birmingham3.55c.
No. 20, f.o.b. cars dock Pacific ports3.55c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh2.75c.
No. 28, Gary2.85c.
No. 28, cars dock Pacific ports..3.35c.

Tin Plate

Base per Box

Standard cokes, f.o.b. Pittsburgh district mill\$5.25
Standard cokes, f.o.b. Gary 5.35
Standard cokes, f.o.b. cars dock Pacific ports 5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.....\$10.00
15-lb. coating I.C..... 12.00
20-lb. coating I.C..... 13.00
25-lb. coating I.C..... 14.00
30-lb. coating I.C..... 15.25
40-lb. coating I.C..... 17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ in.

Base per Lb.

All widths up to 24 in., P'gh...1.85c.
All widths up to 24 in., Chicago.1.95c.
All widths up to 24 in., del'd Detroit2.05c.
All widths up to 24 in., Birmingham2.00c.
Cooperage stock, Pittsburgh ..1.95c.
Cooperage stock, Chicago2.05c.

Cold-Rolled Strips*

Base per Lb.

F.o.b. Pittsburgh2.60c.
F.o.b. Cleveland2.60c.
Del'd Chicago2.895c.
F.o.b. Worcester2.80c.

*Carbon 0.25 and less.

Fender Stock

No. 14, Pittsburgh or Cleveland.2.90c.
No. 14, Worcester3.30c.
No. 20, Pittsburgh or Cleveland.3.30c.
No. 20, Worcester3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

Per Lb.

Bright wire2.40c.
Spring wire3.05c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$3 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg

Standard wire nails\$2.10
Smooth coated nails2.10

Base per 100 Lb.

Annealed fence wire\$2.65
Galvanized fence wire3.00
Polished staples2.80
Galvanized staples3.05
Barbed wire, galvanized2.60
Twisted barless wire2.60
Woven wire fence, base column58
Single loop bale ties, base column51

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

In.	Black Galv.	Wrought Iron
1/4	57 37	1/4 .. +9 1/2 +13
1/2	60 44 1/2	1/2 & 3/4 .. +1 1/2 +21 1/2
3/4	64 1/2 55	1 1/2 .. 31 1/2 15
1	67 1/2 59	2 .. 36 1/2 20 1/2
1 to 3 ..	69 1/2 61 1/2	1 & 1 1/4 .. 39 1/2 25 1/2
		1 1/2 .. 43 1/2 28
		2 .. 41 1/2 26

Lap Weld

In.	Black Galv.	Wrought Iron
2	62 53 1/2	2 .. 37 22 1/2
2 1/2 to 3.65	56 1/2	2 1/2 to 3 1/2 38 25
3 1/2 to 6.67	58 1/2	4 to 8 .. 40 28 1/2
7 & 8.66	56 1/2	9 to 12 .. 38 24 1/2
9 & 10.65 1/2	56	
11 & 12.64 1/2	55	

Butt Weld, extra strong, plain ends
1/455 1/2 42 1/2 1/4 .. +13 +45 1/2
1/2 to 3/4 ..57 1/2 46 1/2 1/2 & 3/4 .. +2 1/2 +34 1/2
1 ..62 1/2 54 1/2 1 1/2 .. 32 1/2 17 1/2
1 1/2 ..66 1/2 58 1/2 2 .. 37 1/2 22 1/2
1 to 3 ..68 61 1 to 2 ..43 1/2 29

Lap Weld, extra strong, plain ends
260 52 1/2 240 26
2 1/2 to 3.64 56 1/2 2 1/2 to 4 45 1/2 33
3 1/2 to 6.67 1/2 60 4 1/2 to 6 45 33 1/2
7 & 8.66 1/2 57 7 & 8.46 33
9 & 10.65 1/2 56 9 to 12 41 1/2 30
11 and 12 64 1/2 55

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

In.	o.d.	13 B.W.G.	Cold Drawn	Hot Rolled
1	o.d.	13 B.W.G. <td>\$ 8.60</td> <td>\$ 7.82</td>	\$ 8.60	\$ 7.82
1 1/4	o.d.	13 B.W.G. <td>10.19</td> <td>9.36</td>	10.19	9.36
1 1/2	o.d.	13 B.W.G. <td>11.26</td> <td>10.23</td>	11.26	10.23
1 3/4	o.d.	13 B.W.G. <td>12.81</td> <td>11.64</td>	12.81	11.64
2	o.d.	13 B.W.G. <td>14.35</td> <td>13.04</td>	14.35	13.04
2 1/4	o.d.	13 B.W.G. <td>16.00</td> <td>14.54</td>	16.00	14.54
2 1/2	o.d.	12 B.W.G. <td>17.61</td> <td>16.01</td>	17.61	16.01
2 3/4	o.d.	12 B.W.G. <td>19.29</td> <td>17.54</td>	19.29	17.54
3	o.d.	12 B.W.G. <td>20.45</td> <td>18.59</td>	20.45	18.59

In.	o.d.	12 B.W.G.	21.45	19.50
3 1/4	o.d. <td>10 B.W.G. <td>41.08 <td>37.35</td> </td></td>	10 B.W.G. <td>41.08 <td>37.35</td> </td>	41.08 <td>37.35</td>	37.35
3 1/2	o.d. <td>11 B.W.G. <td>27.09 <td>24.62</td> </td></td>	11 B.W.G. <td>27.09 <td>24.62</td> </td>	27.09 <td>24.62</td>	24.62
4	o.d. <td>10 B.W.G. <td>33.60 <td>30.54</td> </td></td>	10 B.W.G. <td>33.60 <td>30.54</td> </td>	33.60 <td>30.54</td>	30.54
4 1/4	o.d. <td>10 B.W.G. <td>41.08 <td>37.35</td> </td></td>	10 B.W.G. <td>41.08 <td>37.35</td> </td>	41.08 <td>37.35</td>	37.35
5	o.d. <td>9 B.W.G. <td>51.56 <td>46.87</td> </td></td>	9 B.W.G. <td>51.56 <td>46.87</td> </td>	51.56 <td>46.87</td>	46.87
6	o.d. <td>7 B.W.G. <td>79.15 <td>71.90</td> </td></td>	7 B.W.G. <td>79.15 <td>71.90</td> </td>	79.15 <td>71.90</td>	71.90

Extra for less-carload quantities:

Quantity	Per Lb.	Per 100 Lb.
25,000 lb. or ft. to 39,999 lb. or ft.	5 %	
12,000 lb. or ft. to 24,999 lb. or ft.	12 1/2 %	
6,000 lb. or ft. to 11,999 lb. or ft.	25 %	
2,000 lb. or ft. to 5,999 lb. or ft.	35 %	
Under 2,000 lb. or ft.	50 %	

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago..\$48.40
6-in. and larger, del'd New York 45.20
*6-in. and larger, Birmingham 40.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles 48.00
F.o.b. dock, Seattle 48.50
F.o.b. dock, Seattle 51.50
Class "A" and gas pipe, \$3 extra.
4-in. pipe is \$3 a ton above 6-in.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$39. Birmingham, and \$47.40, delivered Chicago and 4-in. pipe, \$42, Birmingham, and \$50.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
1/2 in. x 6 in. and smaller70, 10 and 5
Larger than 1/2 in.70 and 10
Lag bolts70 and 10
Plow bolts, Nos. 1, 2, 3, and 7 heads70 and 10
Hot-pressed nuts, blank or tapped, square70 and 10
Hot-pressed nuts, blank or tapped, hexagon70 and 10
C.p.c. and t. square or hex. nuts, blank or tapped70 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes 60, 20 and 15
Stove bolts in packages, nuts attached72 1/2, 10 and 10
Stove bolts in packages, with nuts separate72 1/2, 10, 10 and 5
Stove bolts in bulk82 1/2
Tire bolts55

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland..\$2.90
F.o.b. Chicago or Birmingham..3.00

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh70 and 5
F.o.b. Cleveland70 and 5
F.o.b. Chicago and Birm'g'm.70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller 75
Milled headless set screws, cut thread 1/4 in. and smaller75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller85
Upset set screws, cut and oval points75 and 10
Milled studs65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, Base price, \$49 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base2.45c. Delivered price at Detroit is ..2.60c.

S.A.E. Alloy Series

Differential per 100 lb.

2000 (1/2% Nickel)	.....	\$0.25
2100 (2 1/4% Nickel)	.....	0.95
2300 (3 1/2% Nickel)	.....	1.50
2500 (5% Nickel)	.....	2.25
3100 Nickel Chromium	.....	0.55
3200 Nickel Chromium	.....	1.35
3300 Nickel Chromium	.....	3.80
3400 Nickel Chromium	.....	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	.....	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	.....	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	.....	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	.....	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	.....	0.45
5100 Chromium Spring Steel...base	.....
6100 Chromium Vanadium Bar..1.10c.	.....
6100 Chromium Vanadium Spring Steel	.....	\$0.70
Chromium Nickel Vanadium	.....	1.40
Carbon Vanadium	.....	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/4c. per lb. higher with separate extra. Blooms, billets and slabs under 4 1/4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extra.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% NI. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

Item	Per Lb.
Forging billets	.....19.55c.
Bars	.....23c.
Plates	.....26c.
Structural shapes	.....23c.
Sheets	.....33c.
Hot-rolled strip	.....20 1/2c.
Cold-rolled strip	.....27c.
Drawn wire	.....23c.

TOOL STEEL

Base per Lb.

High speed	.....55c.
High carbon chrome	.....35c.
Oil hardening	.....20c.
Extra	.....15c.
Regular	.....12c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental BRITISH

Per Gross Ton

f.o.b. United Kingdom Ports

Based on exchange rate as of May 25

Ferromanganese, export	.....\$44.73
Billets, open-hearth	.....29.22 to \$30.46
Tin plate, per base box	.....4.70 to 4.98
Steel bars, open-hearth	.....39.14
Beams, open-hearth	.....37.90
Channels, open-hearth	.....39.14
Angles, open-hearth	.....37.90
Black sheets, No. 24 gage	.....48.45
Galvanized sheets, No. 24 gage	.....58.39

CONTINENTAL

Per Metric Ton, f.o.b. Continental Ports

Based on exchange rate of May 25

Billets, Thomas	.....\$19.22
Wire rods, No. 5 B.W.G.	.....36.81
Steel bars, merchant	.....26.58
Sheet bars	.....19.63
Plate, 1/4 in. and up	.....35.38
Plate, 3/16 in. and 5 mm.	.....34.76
Sheets, 1/2 in.	.....36.81
Beams, Thomas	.....25.56
Angles (Basic)	.....25.56
Hoops and strip base	.....32.71
Wire, plain, No. 8	.....43.97
Wire nails	.....47.03
Wire, barbed, 4 pt. No. 10 B.W.G.	.....70.57

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	2.95c.
Cold-finished and screw stock:	
Rounds and hexagons	3.35c.
Squares and flats	3.35c.
Hoops and bands under 1/4 in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.69
Spikes, large	3.10c.
Track bolts, all sizes, per 100 count	65 per cent off list
Machine bolts, 100 count	65 per cent off list
Carriage bolts, 100 count	65 per cent off list
Nuts, all styles, 100 count	65 per cent off list
Large rivets, base per 100 lb.	\$3.80
Wire, black, soft ann'l'd, base per 100 lb.	2.90c.
Wire, galv. soft, base per 100 lb.	3.25c.
Common wire nails, per keg	2.35c.
Cement coated nails, per keg	2.35c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.
*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
Per Cent Off List	
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	87 1/2
Cut point set screws	75 and 10
Flat head bright wood screws	70
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57 1/2
Wrought washers	\$4.50 off list
Black ann'l'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.
†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c.
Iron bars	3.31c.
Iron bars, Swed. char-coal	6.75c. to 7.00c.

Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	Special
Long terme sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x 1/2 in. and larger	3.75c.
Open-hearth spring steel	4.00c. to 10.00c.
Common wire nails, base per keg	\$3.21

Per Cent Off List

Machine bolts, square head and nut:	
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel (rounds and flats)	3.25c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	65
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
†Reinforc. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.76c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.40c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

†For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.10c.
†Cold-finished steel bars	3.50c.
Flat-rolled steel under 1/4 in.	3.36c.
Cold-finished strip	†3.00c.

Hot-rolled annealed sheets (No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	\$2.40
*No. 9 galv. wire, per 100 lb.	2.75
*Com. wire nails, base per keg	2.35

†Outside delivery 10c. less.

*For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.72c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg: Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.38c.
Struc. shapes	3.25c.
Soft steel bars	3.05c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Rounds and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.43c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	\$3.15
Black wire, base per 100 lb. (2500-lb. lots or under)	3.50
(Over 2500 lb.)	3.40

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.54c.
Plates—Sheared, tank, and univ. mill, 1/4 in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.45c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.90c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.00c.
Lead coated sheets, No. 24 ga.	5.85c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)**..	4.72c.
Bands	3.39c.
Hoops	3.39c.
†Cold-finished bars	3.64c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts, in cases, 70 and 10 per cent off list	
Broken cases	70 per cent off

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

†With reduction in chemical extras.

**0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

MILWAUKEE

Base per Lb.

Plates and structural shapes..	3.31c.
Soft steel bars, rounds up to 8 in., flats and fillet angles....	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)....	3.16c.
Hot-rolled annealed 3/16-24 in. to 48 in. wide incl.	3.41c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars.....	3.61c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots) ..	3.86c.
Boiler rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.91c.
Track bolts (keg lots)	4.91c.
Black annealed wire	3.40c.
Com. wire nails	2.60c.
Cement coated nails	2.60c.

Per Cent Off List

Machine bolts, 1/2x6 and smaller...	70
Larger than 1/2x6.....	65 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	65 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	3.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	4.02c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24.....	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

*Mild steel bars	3.00c.
**Reinforcing bars	2.85c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheets, No. 10....	3.10c.
†Hot-rolled annealed sheets, No. 24	3.60c.
†Galvanized sheets, No. 24....	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
§Cold-rolled rounds	3.73c.
§Cold-rolled squares, hex. and flats	3.73c.
Rivets	4.40c.
Bolts and nuts, per cent off list 60 and 10	

*Quantity extras per size apply.
†Quantity extras per thickness apply.
Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb., add 50c.
‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.
§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add \$1.00; for 0 to 299 lb. add \$1.75; for combined order under 100 lb. add \$3.00.

**For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.26c.
Iron bars	3.36c.
Reinforcing bars	3.36c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10....	3.36c.
Hot-rolled annealed sheets No. 24	4.16c.
Galvanized sheets, No. 24....	4.86c.
Steel bands	3.61c.
Cold-finished bars	4.13c.

MEMPHIS

Base per Lb.

Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10....	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.80c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list.	50

NEW ORLEANS

Base per Lb.

Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10....	3.55c.
Hot-rolled annealed sheets, No. 24	4.35c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.30c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$2.65
Bolts and nuts, per cent off list	70

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
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Plates, tank and U. M.	3.25c.	3.60c.	3.80c.
Shapes, standard	3.25c.	3.60c.	3.80c.
Soft steel bars..	3.25c.	3.60c.	3.95c.
Reinforcing bars, f.o.b. cars dock Pacific ports..	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.10c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.35c.	3.70c.	3.75c.
Galv. sheets (No. 24 and lighter)	4.50c.	4.40c.	5.00c.
Galv. sheets (No. 22 and heavier)	5.00c.	4.60c.	5.00c.
Cold finished steel			
Rounds	5.80c.	5.85c.	6.00c.
Squares and hexagons.	7.05c.	7.10c.	7.25c.
Flats	7.55c.	7.60c.	8.25c.
Common wire nails—base per keg less carload	\$2.90	\$2.90	\$2.90

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$45.00
High-heat duty, New Jersey....	50.00
High-heat duty, Ohio	40.00
Intermediate, Pennsylvania, Maryland, Kentucky, Mis- souri and Illinois	40.00
Intermediate, New Jersey.....	43.00
Intermediate, Ohio	35.00
Ground fire clay, per ton.....	7.00

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$45.00
Chicago District	54.00
Birmingham	\$48.00 to 50.00
Silica cement per net ton.....	8.00

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plym- outh Meeting and Chester....	\$45.00
Chemically bonded f.o.b. Balti- more, Plymouth Meeting and Chester, Pa.....	45.00

Magnesite Brick

Per Net Ton

Standard, f.o.b. Baltimore and Chester, Pa.	\$65.00
Chemically bonded, f.o.b. Balti- more	55.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks).....	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks.....	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	\$20.50
Delivered Brooklyn	22.9289
Delivered Newark or Jersey City	21.9873
Delivered Philadelphia	21.3132
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.50
F.o.b. Jackson, Ohio	21.25
Delivered Cincinnati	20.5807
F.o.b. Duluth	20.00
F.o.b. Provo, Utah	17.50
Delivered San Francisco, Los Angeles or Seattle	22.315
F.o.b. Birmingham*	15.50

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.; Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	\$20.00
Delivered Boston Switching District	20.50
Delivered Newark or Jersey City	21.4873
Delivered Philadelphia	20.8132
F.o.b. Buffalo	18.50
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.00
Delivered Cincinnati	20.0807
Delivered Canton, Ohio	20.3482
Delivered Mansfield, Ohio	20.8832
F.o.b. Jackson, Ohio	20.75
F.o.b. Provo, Utah	17.00
F.o.b. Birmingham	14.50

Bessemer

F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa.	\$21.50
Delivered Boston Switching District	22.00
Delivered Newark or Jersey City	22.9873
Delivered Philadelphia	22.3132
F.o.b. Buffalo and Erie, Pa., and Duluth	20.50
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Birmingham	20.00
Delivered Cincinnati	21.0807
Delivered Canton, Ohio	21.3482
Delivered Mansfield, Ohio	21.8832

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$24.00
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Gray Forge

Valley or Pittsburgh furnace	\$19.00
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Charcoal

Lake Superior furnace	\$22.00
Delivered Chicago	25.2523

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	22.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Domestic, 80% (carload)	\$75.00

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	130.00

Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 6.00 to 6.50%	\$22.75
For each additional 0.5% silicon up to 12%, 50c. a ton is added.	

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson. Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	Per Gross Ton
10.00 to 10.50%	\$27.75
10.51 to 11.00%	28.25
11.00 to 11.50%	28.75
11.51 to 12.00%	29.25
12%	30.25

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	\$1.30
Ferrotungsten, lots of 5000 lb.	1.35
Ferrotungsten, smaller lots	1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$137.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered.	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

ORES

Lake Superior Ores Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.50%	\$4.80
Old range, non-Bessemer, 51.50%	4.65
Mesabi, Bessemer, 51.50%	4.65
Mesabi, non-Bessemer, 51.50%	4.50
High phosphorus, 51.50%	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% dry Spain or Algeria	10.25c.
Iron, low phos., Swedish, average, 68 1/2% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	26c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	26c.
Man., Brazilian, 46 to 48 1/2%	24c.

Per Net Ton Unit	
Tungsten, Chinese, wolframite, duty paid, delivered, nominal	16.00
Tungsten, domestic, scheelite delivered, nominal	16.00

Per Gross Ton	
Chrome, 45% Cr ₂ O ₃ , lamp, c.i.f. Atlantic Seaboard (African)	\$17.50
45 to 46% Cr ₂ O ₃ (Turkish)	\$16.50 to 17.00
48% Cr ₂ O ₃ (African)	20.50
48% min. Cr ₂ O ₃ (Turkish)	19.25
Chrome concentrate, 50% and over Cr ₂ O ₃ , c.i.f. Atlantic ports	22.00
52% Cr ₂ O ₃ (Turkish)	21.75
48 to 49% Cr ₂ O ₃ (Turkish)	19.25

FLUORSPAR

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00
Domestic, barge and rail	19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.	
F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	5.00c.
Del'd Ch'go, No. 5 industrial	3.77c.
F.o.b. Cleveland, No. 3 distillate	6.00c.
F.o.b. Cleveland, No. 5 industrial	5.00c.

COKE AND COAL

Coke	Per Net Ton
Furnace, f.o.b. Connells-ville Prompt	\$3.65 to \$3.80
Foundry, f.o.b. Connells-ville Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens	9.00
Foundry, by-product, del'd New England	11.50
Foundry, by-product, del'd Newark or Jersey City	9.65
Foundry, by-product, Philadelphia	9.38
Foundry, by-product, delivered Cleveland	9.75
Foundry, by-product, delivered Cincinnati	9.50
Foundry, Birmingham	6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75
Coal	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.90 to 2.10
Gas coal, 1/2-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

FOR *High Quality Steels*

NIAGARA

BRAND

FERRO-ALLOYS

FERRO SILICON

ALL GRADES

FERRO CHROMIUM

HIGH CARBON

FERRO CHROMIUM

LOW CARBON

FERRO MANGANESE

SILICO MANGANESE



**PITTSBURGH
METALLURGICAL CO., Inc.**
NIAGARA FALLS NEW YORK



At the Crossroads of Business Life

(CONCLUDED FROM PAGE 49)

Mineral, Va., closes bids June 2 for pipe for water system and other waterworks installation. Elmer E. Barnard, Law Building, Lynchburg, Va., is consulting engineer.

Big Falls, Minn., plans pipe lines for water system. Financing has been arranged through Federal aid. H. C. Grove, village clerk, in charge.

State Procurement Officer, Treasury Department, Royal Union Life Building, Des Moines, Iowa, asks bids until June 1 for about 27 tons of pipe and fittings; also for valves and valve stands (Proposal 2611).

Niagara, Wis., will purchase pipe and other equipment for water system in open market, following rejection of bids received May 18. Village Board has authorized Dr. S. A. Donovan, president, to make necessary purchases. Federal Engineering Co., Davenport, Iowa, is consulting engineer.

Sturgis Waterworks Co., Sturgis, S. D., plans pipe lines for water system; also other waterworks installation.

Juneau, Alaska, will soon take bids for pipe for water system in Gastineau Avenue to replace present trunk main. Milton Lagergren, city engineer, in charge.

Utilities Committee, Arlington Civic League, Arlington, Tex., is at head of project to build pipe-line from Eagle Mountain Lake for main water supply. Installation will be made under direction of Tarrant County Water Control and Improvement District No. 1. Cost about \$125,000.

Camas, Wash., has authorized bond issue to make total fund of \$21,000 for pipe line for water system and reservoir.

Cicero, Ill., has awarded general contract to Leninger Construction Co., Chicago, for 5500 tons subject to WPA approval.

Oshkosh, Wis., has awarded 200 tons to James B. Clow & Sons.

Evanston, Ill., took bids May 25 on 900 tons of 30-in.

City Council, Trenton, N. J., is considering extensions in pipe lines for water system in Hamilton Township, including main trunk line to Yardville and Groveville districts, about 16 miles. Cost \$245,500 with distributing lines. Proposed to arrange financing in part through Federal aid. Frank M. Winder is director of waterworks department.

Steubenville, Ohio, will ask bids soon for pipe for line from city limits to Wintorsville district for water supply. E. W. Martin, Steubenville, is engineer.

Huron, Ohio, plans pipe lines for extensions in water system; also other waterworks installation. Cost close to \$100,000. It is proposed to engage engineer to make surveys and plans at once.

Colorado Springs, Colo., plans extensions in pipe lines for water supply in Garden of Gods district, about 3500 ft. B. B. McReynolds is superintendent of water department.

Appleton, Wis., has placed 2000 ft. of 6-in. with United States Cast Iron Pipe Co.

De Pere, Wis., closed bids May 25 on 4000 ft. of 6-in. centrifugal cast pipe.

Seattle has bought 140 tons of 8-in. for East Marginal Way pipe line from American Cast Iron Pipe Co.

San Diego, Cal., has placed 326 tons of 12 and 16-in. with United States Pipe & Foundry Co.

Alhambra, Cal., has opened bids on 195 tons on which United States Pipe & Foundry Co. is low bidder.

of the receptionist alone to keep this bubble quality aloft.

To those seeking work, do not permit the ordinary depreciatory-quick-dispatch manner. Remember, they are human beings. Inquire the nature of their abilities. If your firm could possibly use him, have a letter of application suggested. If not, but a source of aid to fit the case is known, do him the honor of suggesting it. Sometimes a sincere, intelligent and thoroughly acceptable applicant referred to the personnel manager works out to a mutual benefit.

Cognizant of the general attitude toward insurance agents that happen in without an appointment, a receptionist can save her people much intrusion on routine. Courteous but firm treatment will command respect of both agent and employer.

The regular applicants for sale of flowers, magazines, ties, cleaning fluids, hosiery, all challenge the callousness of a receptionist's sales resistance. It is the bedraggled, sad-storied beggar that breaks this down. Girls have been known to donate and then report "a pest to be removed from the building." Most receptionists know dozens of trick methods of this "racket." A poem card for a dime; a nail file for a nickel, a job at a distance and no car fare, "so please, could you"; a donation for a mute who with formal petition to sign, wants to open a popcorn stand; the usual request is for the specific nickel and whatever else you can spare. These personal applications for charitable aid are only a part of that type of "beggary." Donation seekers for many kinds of organizations contact either by phone or in person. The inception of a new man in the organization with notices appearing publicly, brings forth a rally of donation seekers and agents. Political endorsement banquets; orphanages; old people's homes; and church groups; all try to catch the prospective "sucker." Most operators recognize an unfamiliar name labeling his business "personal" as this type of caller and by insisting

upon getting down to the nature of his business she will render her own official a service by disposing of the call as promptly and graciously as she can.

The switchboard and reception room may be termed the crossroads of business life. The range of contact is broad and varied, the scale of judgment necessarily humane but at times coldly calculating.

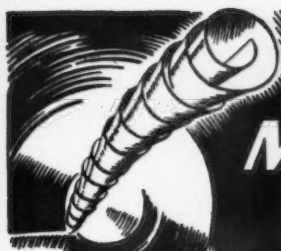
Your switchboard operator and receptionist, should be basically loyal to her employers; intelligently analytical and courteous to all those with whom she comes in contact. Through her efficiency alone, will your telephone become an intelligent servant.

Technical Merits of Steel Are Outlined

IN order to explain to the layman the technical merits of steel as a structural material, the American Institute of Steel Construction, 200 Madison Avenue, New York, has just compiled and published a booklet describing the 14 outstanding qualities of the material. This booklet is intended for general distribution among all persons interested in buildings and bridges of steel and for the education of those who are unacquainted with the metallurgical and engineering technique of steel construction.

Those qualities which differentiate steel from other building materials as listed in the booklet are as follows: Steel is the symbol of strength; it insures security; it makes for speed in construction; it is compact; it reduces fire risk; it will endure; it is elastic; it is adaptable; it is uniform; it is a dreadnaught—in all weather and in any climate steel may be erected; it is fool-proof; it is economic; it can be salvaged; and it is responsible—responsible concerns produce steel and their character is reflected in the quality of the product.

Each quality is fully explained with occasional comparisons with other building materials. Photographs aptly and interestingly illustrate the respective points.



THIS WEEK'S MACHINE TOOL ACTIVITIES

... Barter buying does not always work out well.

o o o

... Possibility of line production necessity in farm implement industries is again noticed.

o o o

... Surface has hardly been scratched in automotive machine tool possibilities.

o o o

By L. M. WAITE

o o o

THE extent to which reciprocity is entering into domestic buying of machine tools is being widely commented upon. Attention is called to the fact that very often second and third choice equipments are being put into production lines, if and when the makers of first choice equipments can not or will not consider terms which contemplate taking the buyer's products in payment of machine and tool invoices.

Reciprocity buying policy is said to be peculiarly infectious, with a decided spreading tendency under conditions of slow machine tool deliveries. It is also referred to as creating resentment, through hardships imposed upon those who would like to compete, but who are not in position to do so on any basis other than payment in usable funds.

A prominent manufacturer points to present German conditions as representing the ultimate in barter buying. There, under government edict, individual import invoices must be actually paid with export products or commodities, with specific approval of government authority on each order placed.

Chicago

A slight buying hesitancy, reported last week, has vanished. Dealers report both sales and inquiries as again sharply upward.

As suggested on May 14, agricultural implement engineers are thoroughly sold on line-production, and indications are that the agricultural group will purchase considerable numbers of standard and special production machines. Already a large amount of machinery is being shifted from one plant to another in order to meet demand pressure for farm implements.

Railroad business has been small and scattered during the week. The Milwaukee Road purchased a grinder. The Rock Island seems to be serious about its list for the Silvis, Ill., shop. This list may appear within two weeks.

Small tools continue in good demand. Buying consideration is definitely directed toward new equipment.

Detroit

With known automotive buying programs out of the way, dealers and factory representatives are extremely busy on the development of proposals involving further possible cost reductions; there is said to be hardly a production job which is not being cooperatively scrutinized from this angle. Companies participating in large modernization expenditures during the past few months have only scratched the surface of what they feel can be done if added legislative restrictions are not imposed upon continuous betterment activities.

Much proposal study is in connection with some rather radical production designs which are not due to materialize until the 1938 season. From all reports, there is an active summer ahead for those

who are to be factors in fall and early 1937 buying.

Cincinnati

During the depression a number of Cincinnati machine tool supply foundries were forced to discontinue business; capable men drifted into other work. Of late the situation has worked a hardship on local makers and has been a factor in delayed deliveries.

This shortage of skilled men, in conjunction with a shortage of skilled mechanics, is being handled with a well-matured apprenticeship program involving experienced shop employees, in the older age brackets, as instructors; young men with the equivalent of a high-school education; and bright, so-called, handy-men with capabilities for development into skilled classifications, as paid students. Results are highly satisfactory.

In sales, grinders, millers and lathes featured the week. Orders eased on drilling machinery as well as on heavy machinery. Operations were sustained in both groups, of course, by the heavy order backlog.

Cleveland

Demand is holding with, if anything, a general upward tendency. Turret lathe orders show a 30 per cent increase over April. The Babcock & Wilcox Co. is still ordering for its Barberton, Ohio, plant; requirements include boring mills, turret lathes and radial drills. The week produced some good business, from Detroit, for drilling and tapping machines. Inquiry for tool-room equipment was heavy during the week, although any gain in orders did not develop.

Foreign

Recent British orders and inquiries involve radial drills, turret lathes, standard lathes, surface grinders, hobbing machines, standard and special toolroom lathes and a number of old Pratt & Whitney hand screw machines to be adapted to special work.

Russian inquiries have covered testing equipment, honing machines, lapping machines, spiral grinding equipment and production lathes. There is reported to be keen competition on equipment lines for automotive cylinder blocks. It is understood that requirements are being studied and quoted on from angles of both complete equipment, including conveyors, and of individual units to be set up by Russian engineers. Former sellers are said to have found it necessary to advance prices, even in the face of stiff competition.

PLANT EXPANSION AND EQUIPMENT BUYING



... **Climax Molybdenum Co., New York, has authorized expansion and improvements in mining properties at Climax, Colo., to cost \$2,500,000.**

□ ○ □

... **Bridgeport Brass Co., Bridgeport, Conn., will expend \$450,000 on an expansion and improvement program.**

○ ○ ○

... **Studebaker-Pacific Corp., Los Angeles, plans an expenditure of \$1,000,000 for an addition for the manufacture of automobile bodies.**

◀ NORTH ATLANTIC ▶

Climax Molybdenum Co., 500 Fifth Avenue, New York, has authorized expansion and improvements in mining properties and milling plant at Climax, Colo., including new crushing plant to double present output, new one and two-story mill change house, 70 x 160 ft.; compressor plant, power house addition, pumping station and other mechanical departments. Mine rail system will be extended and double-tracked and new buildings will be erected for housing development for employees, including hospital and recreation structures. Cost about \$2,500,000 with machinery. G. Meredith Musick, Republic Building, Denver, is architect.

Continental Can Co., 100 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for three-story unit, 120 x 160 ft., and two one-story structures, 40 x 160 ft., and 70 x 100 ft., to branch plant at Houston, Tex. Cost about \$250,000 with equipment. Robert J. Cummins, Bankers' Mortgage Building, Houston, is consulting engineer.

Spring Products Corp., 175 Walnut Avenue, New York, manufacturer of steel springs, spiral springs, etc., has leased part of building at Eutaw and West Streets, Baltimore, for branch plant, primarily for assembling work.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 2 for 4000 ft. of cable and four reels (Circular 234); until June 5, 400,000 ft. of wire, 7000 ft. of cable and two reels (Circular 225).

City Council, Plattsburg, N. Y., has been authorized to arrange fund of \$590,000, of which \$234,000 will be secured through Federal aid, for new municipal electric light and power plant. Bids will be asked soon.

Quartermaster Supply Office, Brooklyn, asks bids until June 3 for one air compressor, two press machines, four tub trucks, one 50-gal. starch cooker and other equipment (Circular 315).

A.P.W. Paper Co., 1273 Broadway, Albany, N. Y., manufacturer of tissue and allied paper stocks, has let general contract to J. P. Sewell, 372 Hudson Avenue, for two-story and basement addition to mill, 200

x 302 ft., for storage and distribution. Cost over \$150,000 with equipment. Johnson & Wierk, Grand Central Terminal, New York, are consulting engineers.

Acce Products, Inc., 24-02 Thirty-ninth Avenue, Long Island City, manufacturer of metal clips, fasteners, etc., has leased building at 39-17 Twenty-fourth Street for expansion.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 5 for 1296 welders' helmets, without lenses (Schedule 7324).

Consolidated Coppermines Corp., 120 Broadway, New York, has authorized extensions and improvements in mining properties at Kimberly, Nev., closed for some time, including new ore-treating mill and other structures, and installation of mining, milling, ore-handling and other machinery. Appropriation is being arranged.

Colgate-Palmolive-Peet Co., 105 Hudson Street, Jersey City, N. J., manufacturer of soaps, etc., has let general contract to Turner Construction Co., 420 Lexington Avenue, New York, for eight-story and basement addition, 50 x 134 ft. Cost over \$350,000 with equipment.

Pennsylvania Distilling Co., Inc., 279 Provost Street, Jersey City, N. J., has plans for one-story addition to distillery at Logansport, Pa., for storage and distribution. Cost over \$80,000 with equipment. M. R. Weiner is company official in charge.

Krich-Radisco, Inc., 560 Broad Street, Newark, N. J., radio equipment, parts, etc., has let general contract to Kasbro Construction Co., 60 Park Place, for one and two-story storage and distributing plant, 117 x 225 ft. Cost about \$65,000 with equipment. Edgar F. Hauser, 11 Clinton Street, is architect.

Board of Public Education, Administration Building, Parkway and Twenty-first Street, Philadelphia, has let general contract to Ralph S. Herzog, 1505 Race Street, for four-story and basement Northeast manual training school, comprising two units, 47 x 298 ft., and 37 x 160 ft. Cost about \$650,000 with equipment. A. B. Anderson is secretary and business manager.

Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, asks bids

until June 1 for machine parts (Circular 282).

Samuel Machinery Co., Inc., 137 North Street, Philadelphia, machinery and tools, has leased building at Allegheny Avenue and Tulip Street, 10,000 sq. ft. floor space, for plant.

◀ NEW ENGLAND ▶

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 3 for thread plug gages, plain plug gages, thread ring gages, check plug gages, snap gages, flat plug gages, one centrality gage and one alignment gage (Circular 234).

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., has plans for two-story addition, 120 x 200 ft., in part for storage and distribution. Cost close to \$100,000 with equipment. Lester Beach Scheide, Inc., 100 Pearl Street, is architect.

Bridgeport Brass Co., East Main Street, Bridgeport, Conn., plans expansion and improvements, including equipment for replacements and increased capacity. Cost about \$450,000. Company has authorized financing through issue of block of capital stock.

Hull Brewing Co., Bond Street, New Haven, Conn., has plans for two-story and basement addition, 60 x 100 ft., primarily for a mechanical-bottling and beer-canning unit. Cost over \$50,000 with equipment. Harold H. Davis and A. M. Thomas, both New Haven, are architect and engineer.

Glenwood Range Co., West Water Street, Taunton, Mass., manufacturer of ranges, parts, etc., plans remodeling and improving one-story building, 150 x 165 ft., for a new enameling division, with installation of furnace units, spraying and other equipment. Cost close to \$45,000 with equipment.

Newport Electric Corp., Newport, Vt., has let general contract to Vappi & MacDonald Co., Inc., 240 Sidney Street, Cambridge, Mass., for new hydroelectric plant. Cost about \$150,000 with equipment. Charles T. Main, Inc., 201 Devonshire Street, Boston, is consulting engineer.

◀ BUFFALO DISTRICT ▶

Industrial Minerals Corp. of America, Inc., 220 Delaware Avenue, Buffalo, operating non-metallic mineral properties in North Carolina, New Mexico and other points, plans new one and multi-story milling plant on Buffalo waterfront for production of a new building product, using vermiculite as raw material. Crushing, grinding, sorting and other equipment will be installed. Cost about \$100,000 with machinery.

Stebbins Engineering & Mfg. Co., Watertown, N. Y., manufacturer of pulp mill machinery, parts, etc., has plans for three one-story additions. Cost over \$50,000 with equipment.

K. R. Wilson, 10 Lock Street, Buffalo, manufacturer of machinery and tools for automobile repair shops, has let general contract to H. K. Ferguson Co., Cleveland, for rebuilding plant at Arcade, N. Y., destroyed by fire last February. Cost over \$100,000 with equipment.

◀ OHIO AND INDIANA ▶

Libbey-Owens-Ford Glass Co., Nicholas Building, Toledo, Ohio, has plans for additions to plant at Rossford, near Toledo, comprising seven one-story units, 80 x 400 ft., 150 x 233 ft., 60 x 260 ft., and 42 x 104 ft., for cutting, washing, packing, storage and distribution; and three one-story buildings for mechanical division, 95 x 110 ft., and two 75 x 90 ft. Seven overhead electric cranes will be installed. Company will also build new steam power house at East Toledo plant, to include steam-generating units and accessories. Entire project will cost about \$700,000 with equipment.

Clark Controller Co., 1140 East 152nd Street, Cleveland, manufacturer of electric control equipment and parts, has let general contract to J. L. Hunting Co., Ninth Street-Chester Building, for one-story L-shaped



*Shorty
lost his Eye!*

and Production COSTS GO UP

SHORTY ran a lathe — without goggles. He didn't expect that chip to pierce his eye—*no worker who goes without goggles ever does*. From now on—it's a glass eye for Shorty.

Goggles would have prevented the accident—and saved the \$2000 and more which that glass eye will cost in compensation. Where eye hazards exist and goggles *are not worn* you pay for goggles whether you buy them or not. And the cost of a single sightless eye

buys the finest eye protection equipment for more than 1000 men.

American Optical Company has developed a complete line of strong, cool, comfortable goggles for every industrial eye hazard. Men wear them willingly. Write today for an American Optical Company Industrial Representative, stationed in a branch office near you, to show you this eye-saving, money-saving equipment.



American Optical Company



The F-3100 Ful-Vue goggle offers all-day-long comfort... unobstructed vision... the protection of the 6-Curve Super Armorplate Lens—far stronger than lenses regularly used in standard safety goggles. Patented.

Manufacturers, for more than 100 years, of products to aid and preserve vision. Factories at Southbridge, Mass. In Canada, Consolidated Optical Co., Ltd. Branch offices in all principal industrial centers

addition, 50 x 60 ft., and 30 x 50 ft., on two-acre tract adjoining, recently acquired. Cost about \$50,000 with equipment. Edward G. Hoefler, 5005 Euclid Avenue, is consulting engineer. Company plans other additions later.

National Superior Co., 3320 Bishop Street, Toledo, Ohio, manufacturer of oil well equipment and supplies, gas engines, etc., a subsidiary of National Supply Co., same address, will begin superstructure at once for one-story addition, 82 x 290 ft. Cost about \$100,000 with machinery.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until June 1 for solderless connectors, solderless nipples, nuts, sleeves, solderless tees and unions (Circular 867); until June 2, brake shoe grinder with motor (Circular 847), aircraft engines (Circular 793), 20 electric power plants (Circular 854); until June 3, 350 wind cones (Circular 862), five rotary brush type sweepers and five spare brush cores (Circular 844), three motor-driven press brakes (Circular 843), 15 manometer assemblies (Circular 848), two dual-installation air compressors (Circular 971); until June 4, 1300 bank-and-turn indicator assemblies, 1400 rate-of-climb indicator assemblies (Circular 828); until June 5, streamline tie-rods (Circular 873), four metal-cutting band saws (Circular 859), 164 electric carburetor temperature gage assemblies, 164 electric oil temperature gage assemblies (Circular 868); until June 6, hand tube bender flaring tools (Circular 882).

Pierce Governor Co., 1525 Ohio Avenue, Anderson, Ind., manufacturer of speed governors and other automotive equipment, has plans for one-story addition, 50 x 100 ft., primarily for production of automobile chokes and kindred specialties. Cost close to \$50,000 with equipment. E. R. Watkins, Anderson Bank Building, is architect.

Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until June 1 for bolts, blacksmith rasps, carpenter wrecking bars, mess stools and other equipment (Circular 285).

◀ WESTERN PA. DIST. ▶

Duquesne Mine Supply Co., 2 Cross Street, Pittsburgh, plans one-story addition to plant in Millvale district. Cost close to \$40,000 with equipment.

Owens-Illinois Can Co., Ohio Building, Toledo, Ohio, subsidiary of Owens-Illinois Glass Co., recently organized to take over plant and business of Enterprise Can Co., McKees Rocks, Pa., has let general contract to Hughes-Foulkrod Co., Schaff Building, Philadelphia, for one-story addition to last noted plant. Cost over \$50,000 with equipment.

Erie Resistor Corp., 644 West Twelfth Street, Erie, Pa., manufacturer of electrical products, plans three-story and basement addition, 56 x 85 ft. Cost close to \$60,000 with equipment.

◀ SOUTH CENTRAL ▶

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 1 for conveying machinery, geared-head motors and conveyer belting for Guntersville Dam; also for fabricating and delivering one all-welded single screw tunnel stern Diesel-powered towboat, 180-hp., 64 ft. long, for Pickwick Landing Dam.

Mission Springs Distilling Co., Inc., 406 Republic Building, Louisville, recently organized, has plans for new works at Vine Grove, Ky., comprising several one-story units for main distillery, fermenting house, mechanical-bottling works, storage and distribution; a power house will be built. Cost about \$180,000 with machinery.

Louisville Water Co., 435 South Third Street, Louisville, asks bids until June 23 for extensions and improvements in power house and pumping station on River Road, including boiler equipment, traveling intake screens and other equipment. John Chambers is chief engineer.

United States Engineer Office, Vicksburg, Miss., asks bids until June 2 for one heavy-duty, gasoline engine-driven electric welding machine, portable truck type (Circular

274), two leaning wheel road graders (Circular 279).

W. C. Nabors Co., Mansfield, La., manufacturer of motor trailers, parts, etc., has acquired site at Jackson, Miss., for one-story branch plant, for which superstructure will begin soon. Cost about \$35,000 with equipment.

United States Engineer Office, Second District, New Orleans, asks bids until June 1 for 20 20-in. cast steel ball joints, complete with gaskets (Circular 569).

◀ WASHINGTON DIST. ▶

Contracting Officer, Quartermaster Corps, Fort Monroe, Va., asks bids until June 1 for nails, wood screws, brass unions, brass elbows, hacksaw blades, nuts, brass pipe, set engine wrenches, three band saws, two pumps and other equipment (Circular 84).

Oakwood Smokeless Coal Corp., Bluefield, W. Va., plans development of coal-mining properties in Buchanan County, near Hanger, Va., including new coal tippie, shaker screens, conveying, elevating and other equipment; also coal-mining machinery and mine cars. Majority of equipment will be electric-operated. Cost over \$200,000.

General Purchasing Officer, Panama Canal, Washington, asks bids until June 4 for 33,000 ft. of wire rope, 20,000 lb. soft steel wire, 315,000 ft. tinned copper wire, 500 lb. magnet wire, 38,000 lb. common wire nails, 11,000 lb. galvanized steel-wire roofing nails, 8000 lb. wire finishing nails, 1500 lb. galvanized boat spikes, two 5-hp. electric motors, rigid steel conduit, elbows, copper pipe, transformers, one 10-ton chain hoist, four 1-ton chain hoists, wheelbarrows and other equipment (Schedule 3148).

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 5 for parts for fire trucks (Circular 152), 19 two-wheel trailers (Circular 148).

Commanding Officer, Naval Air Station, Hampton Roads, Va., plans rebuilding of shop in local aircraft overhaul department group, recently destroyed by fire. Loss about \$60,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 2 for one motor-driven milling machine with equipment for Norfolk, Va., Navy yard (Schedule 7998); countersinks and reamers (Schedule 7916), steel sockets for Morse taper shank tools (Schedule 7930), wood-boring bits, chisels, knives, etc. (Schedule 7941), wrenches (Schedule 7940); until June 5, taps, dies, diestocks and wrenches (Schedule 7960), solder (Schedule 7995), gages, planes, calipers, squares, etc. (Schedule 7954), seamless copper tubing (Schedule 7977) for Eastern and Western Navy yards.

◀ MIDDLE WEST ▶

Chicago Screw Co., 1026 South Homan Avenue, Chicago, affiliated with Standard Screw Co., same address, has plans for one-story addition and improvements in present plant. Cost over \$50,000 with equipment. Jean B. Fischer, 7322 Lafayette Street, is architect.

Armour & Co., Union Stock Yards, Chicago, will take bids at once on general contract for three three and four-story additions, with part of one unit six stories, to branch plant at Omaha, Neb. Cost about \$700,000 with equipment. F. A. Linberg, first noted address, is company engineer in charge.

Midway Motor Co., 209 South Newton Street, Albert Lea, Minn., has let general contract to John F. Hansen, Home Investment Building, for two-story machine and welding shop. Cost about \$30,000 with equipment.

United States Gypsum Co., 300 West Adams Street, Chicago, has asked bids on general contract for new factory branch, storage and distributing plant, one-story, 58 x 420 ft., at Heath, Mont. Cost over \$100,000 with equipment.

Commonwealth Edison Co., 72 West Adams Street, Chicago, has authorized extensions and improvements in steam-electric generating plant at Twenty-second and Fisk Streets, and modernization of plant. Contract for new turbo-generator unit has

been let to Allis-Chalmers Co., Milwaukee, and for high-pressure boilers and accessories to Babcock & Wilcox Co., New York; awards for other equipment will be made soon. Work is scheduled for completion in about 18 months and will cost close to \$3,000,000 with equipment.

Line Material Co., South Milwaukee, Wis., manufacturer of electrical transmission supplies, has plans for new transformer shop, 180 x 200 ft., two stories and part basement, to cost about \$150,000 with equipment. Project is contingent upon vacation of dead-end street between present shops.

Plankinton Packing Co., 230 South Muskego Avenue, Milwaukee, has placed general contract with Hunzinger Construction Co., 1827 North Thirtieth Street, for addition, 100 x 150 ft., one-story and part basement, to livestock feed and fertilizer plant, costing about \$80,000 with grinding and mixing equipment, motors, etc.

Cedarburg, Wis., City Light & Water Commission plans purchase of new 500 or 750-hp. Diesel engine unit to expand capacity of municipal power plant. A. W. Robben is chairman.

Fond du Lac, Wis., County Board has appropriated \$40,000 for addition to County highway department headquarters building and new shop equipment. John H. Bottkol is highway commissioner.

◀ SOUTHWEST ▶

Chicago, Rock Island & Pacific Railway Co., LaSalle Street Station, Chicago, has let general contract to Kansas City Structural Co., Kansas City, Kan., for one-story machine shop in Armourdale district, Kansas City, Kan., 80 x 120 ft. Cost close to \$50,000 with equipment.

City Council, Thayer, Mo., asks bids until June 10 for new municipal electric power plant, including Diesel engine-generator units with accessories, fuel oil storage tank, cooling tower and auxiliary equipment; also for electrical distribution system. Cost about \$72,000. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is consulting engineer. (Bids recently asked, closing May 14, have been rejected.)

W. M. Mount and Charles Cooper, Main Street and U. S. Highway 64, Sand Springs, Okla., have taken over one-story plant, 75 x 300 ft., location noted, and will remodel for production of steel tanks and other plate products.

Buck X-Ograph Co., 8709 Xograph Avenue, St. Louis, manufacturer of X-ray equipment and parts, precision products, etc., has let general contract to Bumiller & Meyersieck, 1921 Marcus Avenue, for two-story addition, 35 x 95 ft. Cost about \$50,000 with equipment.

Taubman Supply Co., National Bank of Tulsa Building, Tulsa, Okla., oil well equipment and supplies, has let general contract to William A. Brunet, Shell Building, Houston, Tex., for new one-story plant, with foundations for additional stories at Houston. Cost about \$75,000 with equipment.

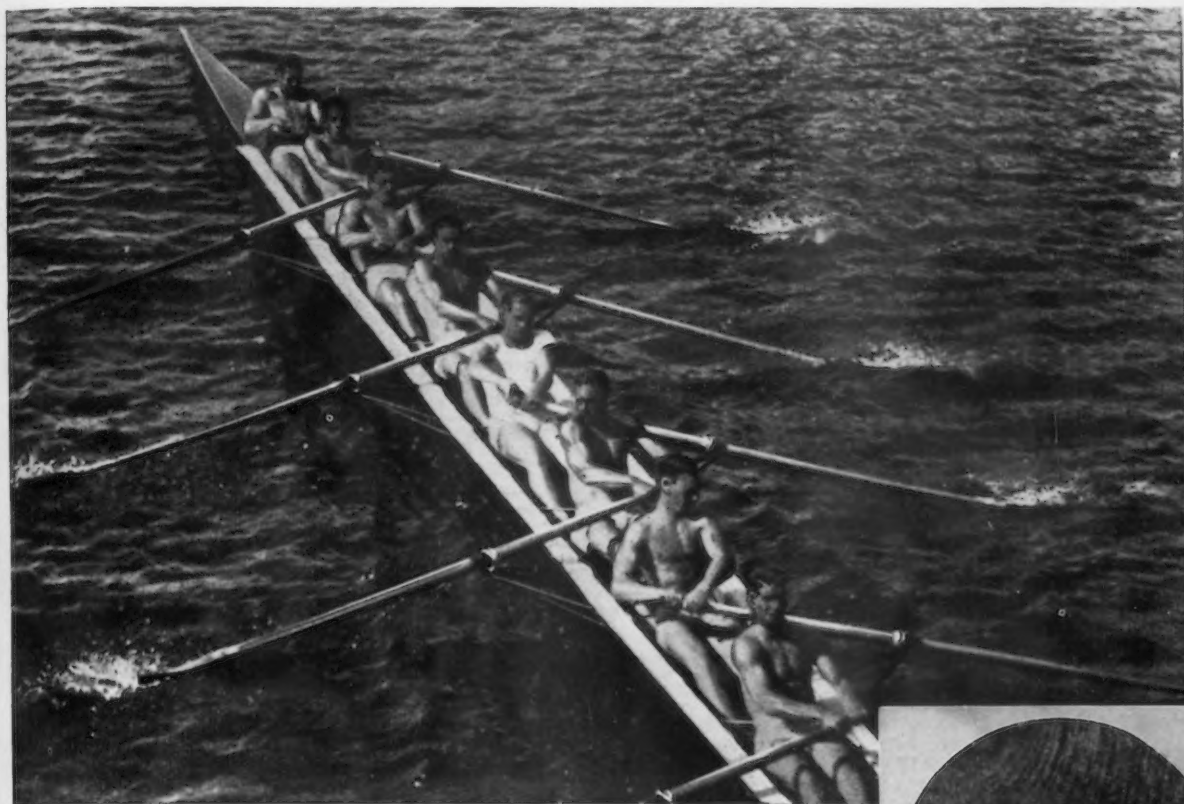
City Council, Perryton, Tex., plans new municipal electric light and power plant, using Diesel engine-generating units with accessories, and electrical distributing system. Cost about \$150,000. Bond issue is being arranged. E. T. Archer & Co., New England Building, Kansas City, Co., are consulting engineers.

◀ SOUTH ATLANTIC ▶

Container Corp. of America, Inc., 111 West Washington Street, Chicago, manufacturer of corrugated paper boxes and cartons, shipping containers, etc., has plans for new kraft pulp and paper mill at Fernandina, Fla. It will comprise one and multi-story units for pulp mill, paper-making and finishing mills, with power house, pumping plant, machine shop and other mechanical departments. Cost about \$5,500,000 with machinery. Financing has been authorized through sale of preferred stock to total about \$10,000,000. It is understood that a subsidiary will be formed, to be known as Kraft Corp., to operate Fernandina mill. George F. Hardy, 305 Broadway, New York, is consulting engineer.

United States Engineer Office, Charleston, S. C., asks bids until June 1 for two

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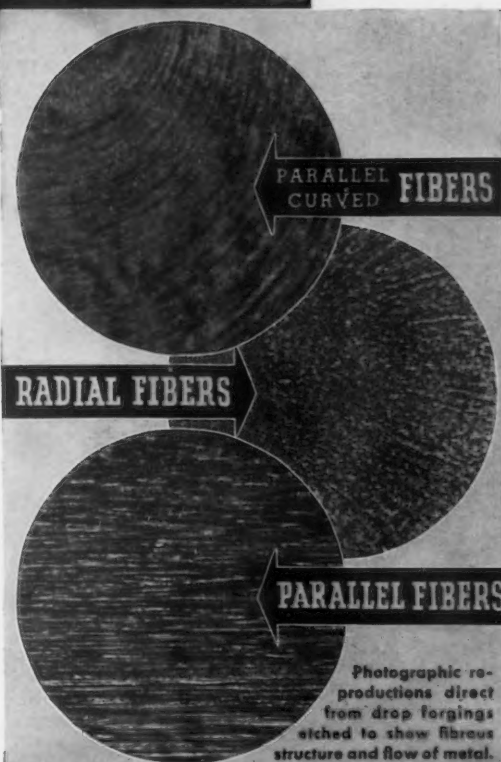
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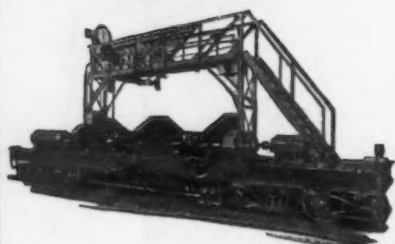
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six-blade cast steel spiral cutters and two cast steel winding drums (Circular 79).

Globe-Union Mfg. Co., East Keefe Avenue, Milwaukee, manufacturer of electric storage batteries and parts, has begun superstructure for one-story branch plant, 100 x 200 ft., at Atlanta, Ga., for which general contract recently was let to W. Monroe Butler, Atlanta. Cost over \$50,000 with equipment.

◀ MICHIGAN DISTRICT ▶

Northern Refineries, Inc., Alma, Mich., recently organized, care of E. G. Guy, Mount Pleasant, Mich., engineer, has plans for new oil refinery at Alma, where 20-acre tract has been acquired. Storage and distributing division will be installed, with steel tanks and other facilities. Cost about \$90,000 with equipment.

Trenton Valley Distillers Corp., Trenton, Mich., has plans for six-story addition, 85 x 200 ft., primarily for storage and distribution. Cost about \$185,000 with equipment. George F. Diehl, 120 Madison Street, Detroit, is architect.

Chrysler Corp., 341 Massachusetts Avenue, Detroit, has let general contract to H. R. Blagg Co., 1229 East Third Street, Dayton, Ohio, for extensions and improvements in local branch plant, including modernization of existing buildings, to be occupied by Airtemp, Inc., a subsidiary, manufacturer of air-conditioning equipment and systems. Dayton plant will be given over to new line of production noted, which has been utilizing part of one of Chrysler plants at Detroit. Entire unit will be removed to new location, and space vacated at Detroit will be given over to automobile manufacture. B. T. Moyer is president of Airtemp, Inc. Geyer & Neuffer, Ludlow Arcade Building, Dayton, are architects.

Unitor Corp., 250 West Lafayette Street, Detroit, manufacturer of electric household appliances and equipment, parts, etc., has plans for extensions and improvements in factory, including new equipment. Cost over \$45,000. Cyril E. Schley, Lafayette Building, is architect.

◀ PACIFIC COAST ▶

Studebaker-Pacific Corp., Central Manufacturing District, Los Angeles., has plans for one-story addition for production of automobile bodies, including parts manufacture and assembling. Cost about \$1,000,000 with machinery. Company is a subsidiary of Studebaker Corp., South Bend, Ind.

Cherokee Vineyard Association, Acampo, San Joaquin County, Cal., will take bids soon on general contract for new winery at Georgia Station, near Acampo, with power house, machine shop and other mechanical structures. Cost about \$150,000 with machinery. Peter Sala, 2130 North Commerce Street, Stockton, Cal., is architect.

Board of Kern County Supervisors, Bakersfield, Cal., has revised plans for new hangar, repair and reconditioning shop, 132 x 300 ft., at County airport, near city. Cost about \$140,000 with equipment. Financing has been arranged through Federal aid. Charles H. Biggar, Haberfelde Building, Bakersfield, is architect; L. H. Nishkian, 525 Market Street, San Francisco, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 2 for two motor-driven sensitive drill presses for Puget Sound Navy yard (Schedule 7971).

Board of Public Works, Spokane, Wash., has let general contract to Puget Sound Construction Co., Seattle, for new municipal power plant, to be known as Upriver power station. Cost about \$250,000 with equipment. Extensions will be made in transmission lines.

Casein Mfg. Co. of America, Inc., 701 Myrtle Street, Seattle, manufacturer of glues, adhesives, etc., plans rebuilding part of plant recently destroyed by fire. Loss close to \$125,000 with equipment. Headquarters of company are at 350 Madison Avenue, New York.

Lockheed Aircraft Corp., Burbank, Cal., plans expansion and improvements, including several one-story units and installation of equipment. Cost over \$250,000 with machinery. Company has authorized financing

through the sale of 63,535 shares of capital stock, part of proceeds to be used for purpose noted.

Town Council, Seward, Alaska, A. D. Balderston, town clerk, asks bids until July 20 through Hubbell & Waller Engineering Corp., Alaska Building, Seattle, consulting engineer, for new hydroelectric generating plant in Lost Lakes district, with two 375-kva. or one 500-kva. capacity hydraulic turbine generator, with accessories; also for new power transmission line to Seward, about 11 miles long, and power substation at town limits. Fund of \$140,000 has been arranged through Federal aid. Engineers noted are in charge.

◀ FOREIGN ▶

Cerro de Pasco Copper Corp., 44 Wall Street, New York, will expend about \$2,500,000 this year for extensions and improvements in copper mining and refining properties in Peru, including completion of new smoke prevention and dust recovery processing equipment installation, hydroelectric power plant, new machinery installations and other work. E. H. Clark is president.

Department of Government Railways, Adelaide, South Australia, asks bids until June 30 for one Diesel locomotive for service at Islington shops.

Ministry of Public Works, Buenos Aires, Argentina, has plans for new airport on local waterfront to include hangars, repair and reconditioning shops, oil storage and distributing buildings, administration building and other field structures. Cost about 10,000,000 pesos (about \$3,300,000 with equipment).

Nickel Consumption Above 1929 Levels

A STUDY of world consumption figures of six leading non-ferrous metals, conducted by the International Nickel Co. of Canada, Ltd., shows that nickel is the only one of the group which had in 1935 a wider use by world industry than in 1929. Whereas copper and lead each showed a decrease in consumption of more than 13 per cent, zinc a decrease of more than 10 per cent and tin of about 23½ per cent, consumption of nickel expanded more than 17½ per cent in 1935 compared with 1929. Use of aluminum, though slightly lower, did not vary appreciably.

Despite the healthy growth of its use by industry during recent years, the report points out that nickel stands at the bottom of the list from the standpoint of tonnage consumed. World consumption in 1929 is estimated at 68,000 short tons, compared with 80,000 tons last year. On the other hand, by way of contrast, the 1929 consumption of copper is given as 2,085,000 tons.

Lewis Foundry & Machine Co., Pittsburgh, a subsidiary of Blaw-Knox Co., has been awarded contracts for two 3-high mills by the Amtorg Trading Corp. for Russia. They will be designed for making tinplate breakdowns from 12-mm. bars.